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THE GREAT LAKES WATER LEVELS NEWSLETTER MT 160

APRII Vol 1 No 1 1990

· Update of 1990 forecasted Great Lakes water levels

· Explanation of the drop in water levels since 1986 Update on the International Joint Commission Water Levels Reference Study

· Survey of Great Lakes shoreline property owners · Flood and erosion mapping

Why do levels fluctuate?

In this

issue

first

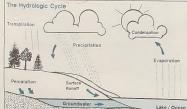
Climatic factors have the most significant impact on Great Lakes water levels. Precipitation in the form of snow and rain, run-off from the surrounding land, and the inflow of groundwater contribute water to the system. Evaporation from the lake surface, outflow at the lake cutlet, and groundwater outflow all remove water from the system. It is the combined effect of these factors that determine water levels.

Water levels will rise when the amount of water entering the system. is greater than the amount of water leaving the system. Water levels fall when the amount of water leaving the lakes is greater than the amount of water entering



levels being lower than for the same time period in the preceding year. This trend is continuing on the upper lakes as we enter the spring of 1990. Lakes Superior and Huron (including Georgian Bay) are about 15 to 25 centimetres below their levels of the spring of 1989. Heavy trend on Lakes Erie and St. Clair. and they are presently 15 to 20

water precipitation has reversed this centimetres above spring 1989 levels. As the outflows of Lake Ontario are regulated, its levels have not followed the patterns on the upper lakes as closely during the past three years. At the end of March, Lake Ontario was about 35 centimetres above its level of one year ago.



Great Lakes Water Levels in 1990 Water levels on the Great Lakes

have declined steadily since 1986.

spring to mid-summer and lower

levels in winter. While seasonal

There is also a seasonal pattern of

fluctuations with higher levels in late

changes in levels occur, since 1986

there has been a general pattern of

Despite the fluctuations in water levels, all of the lakes are within 30 centimetres of their long term average levels for this century.

Each month, Environment Canada prepares a forecast of lake levels for the following six months. The forecast is based on historical records of supplies of water to the lakes resulting from precipitation, land runoff, and evaporation. Forecasts are prepared for three scenarios average supplies, high supplies, and low supplies. To determine the forecasted lake levels, these scenarios are applied to current lake levels (over the forecast period); the regulation plans are consulted for the control structures on the St. Mary's and St. Lawrence Rivers; and the flows from one lake to another are calculated.

Through this procedure, the most likely levels for each lake over the following six months are estimated. as well as the range within which the levels are likely to be. However. there is always the possibility that

levels could be outside of this range. It is important to note that the forecast does not currently consider factors such as the amount of snow lying on the ground, how wet or dry the land in the drainage basin is, or any long range forecast of weather

conditions.

The current levels forecast indicates that, with average water supplies, this summer's levels on all of the lakes will be 10 to 20 centimetres below those of 1989.

If wet conditions should occur this spring, summer levels on the lakes could be near or slightly above those of last summer. On the other hand. dry conditions could result in summer levels being well below those of last summer.

Why did lake levels drop so rapidly since 1986?

and 1988.

490 cubic kilometres.

Michigan and Huron.

much less severe

the Lake Superior basin and

Lakes Michigan-Huron basin

one-half of the average on the

During the drought of 1988, high

Great Lakes, particularly on Lakes

Although Lake Ontario's level also

dropped in 1987-88 in response to

reduced water supplies from the

upper lakes the decrease was

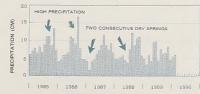
evaporation occurred over the

Great Lakes water levels fluctuate according to the climate of the region. From 1967 to 1986. persistently above-average precipitation on the basin kept lake levels above average. The record high precipitation in 1985 pushed levels over their previous 20th century records during 1985 and 1986. What followed next was an unprecedented rapid drop in levels On August 1, 1986 the beginning in October 1986. The governments of Canada and the cause of this rapid drop was the dry winter of 1986-87, followed by

two consecutive dry springs in 1987 levels in the Great Lakes-St Since lake levels (except Lake Lawrence River Basin. The Ontario) were at their record highs Progress Report presented to the in late 1986, this made the drop IJC in August 1989 represents much more spectacular. The twelve-month reduction in total Great Lakes water volume between Summary, a Main Report, and November 1986 and November seven subject specific Annexes. 1987 was a record 560 cubic Reports have been distributed to kilometres. It exceeded the libraries and locations around the previous record drop in 1930-31 of IJC office at (613) 995-2984, or In 1987, the estimated runoff was only one third of the average on

> On February 9, 1990, the Phase II of the 1986 Reference from federal agencies, four state agencies and two representatives from non-governmental or citizen

Great Lakes Basin Precipitation 1985-1990



YEAR

International Joint Commission Great Lakes Water Levels Reference Study

The International Joint Commission (IJC) is a binational organization established by the Boundary Waters Treaty of 1909. The Commission is responsible for boundary water issues between Canada and the United States. It receives its mandate from the federal governments of both countries.

United States asked the IJC to examine and report upon the methods of alleviating the adverse consequences of fluctuation water completion of Phase I of the study The Report consists of an Executive Great Lakes basin. To obtain a list contact Alan Clarke in the Ottawa Frank Bevacqua in the Washington office at (202) 673-6222

Commission approved a Directive to establish a nine member Levels Reference Study Board to complete Study. Board members include a study director, two representatives representatives from provincial or groups.

The primary role of the Study Board will be to supervise the completion of all studies relevant to the objectives of the Reference and to prepare a final report for the Commission on its findings.

A study director will be hired to serve on the Board and to assist the Board in carrying out its responsibilities

The Board has been directed to submit a plan of study for Phase IT to the IJC by mid-May. The plan of study will address but not be limited to the following objectives of Phase

- -to establish a set of guiding principles the Commission could propose to Governments to deal with fluctuating water levels;
- to conduct short term studies in several areas to further clarify these principles:
- -to evaluate a range of management measures for a variety of type-specific sites around the basin.

The Commission has made a commitment to ensure members of the public and various interests are involved in the Phase II study process. The IJC has promoted public involvement by including non-government members on the Study Board. In addition a Citizens Advisory Committee has been established to assist the Board in developing and carrying out public participation programs for Phase II The Board will prepare bimonthly reports on progress and problems These reports will be submitted to the Commission. All reports. meeting records, and documents prepared by the Board will be available for public review.

Riparian Survey

Did you ever wonder how many people live on the shores of the Great Lakes? Environment Canada will soon have this information through the results of an extensive census they have undertaken of all shoreline properties located on the Great Lakes and St. Lawrence River. A similar inventory is under way in the United States by the U.S. Army Corps of Engineers.

Further to this census. Environment Canada has recently mailed out some 24,000 questionnaires to a random sample of Canadian shoreline property owners (riparians) on the Great Lakes. This has been done in an effort to survey riparians about their experiences with water level changes, to gain a greater understanding of their views on the issue, and to identify what they see as solutions to the problems associated with extreme high and low water levels.

This information, along with the census data, will allow Environment Canada to analyze and relate property owner perceptions, sensitivities, and preferences for solutions. In essence, the survey provides riparians with an opportunity for input into the process of planning for the future of the Basin.

A similar survey under way in the United States through the U.S. Army Corps of Engineers will facilitate Basin-wide analysis. This will be of benefit to the International Joint Commission in the Phase II of their Water Levels Reference Study.

Communications Task Group

On March 21, 1990 a group of appointed individuals and representatives from government and other organizations in the United States and Canada, participated in the second of four IJC communications workshops. This Task Group was organized to assist the International Joint Commission in fulfilling the August, 1986 Reference request to "develop an information program which could be carried out by responsible government agencies to better inform the public on lake level fluctuations".

The Task Group is developing specific levels issue, and a set of recommendations which could be made to the Governments of Canada and the United States regarding the implementation of the initiatives.

A preliminary report based on the work of the first two workshops will be sent to a review committee in both countries for comments. The final information program should be ready for review in the fall of

In the fall of 1989, the IJC's Lake Superior Board completed an improvement study of the Lake Superior Regulation Plan 1977. A report has been submitted to the IJC for consideration. Options for improving the Lake Ontario Regulation Plan 1958-D are also under consideration by a working committee of the St. Lawrence River



OTHER ACTIVITIES



Port Franks, Lake Huron Spring 1987

Shoreline Flood & Erosion Mapping Program

Flood and erosion hazard mapping for selected shorelines of the Great

Lakes has been initiated under the Canada/Ontario Flood Damage Reduction Program through local Conservation Authorities. Aerial photography of the shoreline is complete and map preparation has begun.

Canadian Water Resources Association and American Water Resources Association Conference A number of technical papers on the lake levels issue were presented at

the April 1-4, 1989 joint Conference of the Canadian & American Water Resources Associations in Toronto. These papers were derived from work accomplished during the Phase I IJC Reference Study. Copies of the Conference proceedings may be obtained for a fee through Dr. J. Fitzgibbon of the University of Guelph. Individual copies of papers are available through the Great Lakes Water Levels Communications Centre in

New Brochure on Lake Regulation Soon to be released is a public brochure on Great Lakes - St. Lawrence

River Regulation. This is a joint effort by Environment Canada and the U.S. Army Corps of Engineers. The brochure explains when and why Lake Superior and Lake Ontario regulation came about, how it works, and the benefits and limitations of existing regulation plans.

Pelee Shoreland Management Study

The Point Pelee area has a long history of serious erosion and flooding wetland areas.

A multi-agency planning study involving municipal, provincial and federal governments and local conservation authorities has been initiated to develop a management plan for the Lake Erie shoreline from Port Crewe Lake Erie flood levels.

Although the scope and funding of this project is as yet uncertain, government agencies have shown a great deal of support for this project.

Lake Regulation Improvements

Board.

Canadä

The Great Lakes Water Levels Communications Centre 867 Lakeshore Road, P.O. Box 5050 Burlington, Ontario L7R 4A6

Please contact this Centre if you have topics that you wish to hear about in the malling list.

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Source: National Oceanic and Atmospheric Administration

LE NIVEAU DES GRANDS LACS



BULLETIN D'INFORMATION

Avril 1990 Vol 1 no 1

Dans ce premier numéro

- Environment Environment e Le point sur le niveau des Grands Lacs prévu en 1990
- Explication de la baisse du niveau des lacs depuis 1986 Le point sur l'étude sur le niveau des Grands Lacs
- de la Commission mixte internationale Sondage auprès des propriétaires riverains des Grands Lacs · Carte des zones d'inondations et d'érosion

Pourquoi le niveau des Grands Lacs varie-t-il?

Ce sont les conditions climatiques oul influencent le plus le niveau des Grands Lacs. Les précipitations sous forme de neige et de pluie, le ruissellement provenant des zones environnantes et le débit entrant des paux souterraines alimentent les Grands Lacs. En outre, l'eau sort du Huron (y compris la baie s'écoulant sous forme de débit sortant et d'eau souterraine. C'est l'équilibre de ces divers facteurs qui détermine le niveau des Grands

Lorsque la quantité d'eau qui entre dans le système est plus élevée que celle gul en sort, le niveau de l'eau augmente. Le niveau de l'eau baisse lorsque la quantité d'eau qui sort des Grands Lacs est plus élevée que celle qui y entre.

Le niveau des Grands Lacs

Le cycle de l'eau

Percolation

Le niveau des Grands Lacs ne cesse d'eau, tous les lacs ont un niveau de baisser depuis 1986. Le niveau effet, on enregistre les niveaux les

Ruissellement

Eau souterraine

milian de l'été et les niveaux les nive bas en hiver Malgré ces variations saisonnières, on a enregistré, depuis Cette prévision se fonde sur les 1986, des niveaux d'eau plus bas que l'année précédente à la même époque. A l'aube du printemps 1990, cette tendance se poursuit pour les lac de la région supérieure. Le niveau du lac Supérieur et du lac lac en s'évaporant de la surface, en Géorgienne) à baissé de 15 à 25 cm lacs, on applique chacune de ces par rapport au printemps 1989. Les précipitations abondantes de cet hiver ont renversé cette tendance pour les lacs Érié et Saint Claire, En effet. le niveau de ces lacs a augmenté de 15 à 20 cm par rapport. Sainte-Marie et du fleuve Saint au printemps 1989. Étant donné que Laurent, et l'on calcule le débit le débit sortant du lac Ontario est rénularisé le niveau de celui-ci ne se suit pas d'aussi près, depuis ces trois dernières années, la tendance des autres lacs. En effet, à la fin de mars. le niveau du lac Ontario avait augmenté d'environ 35 cm par rapport à l'année dernière.

En dépit de la variation des niveaux qui se situe à 30 cm au moins du dépend également des saisons. En niveau moyen à long terme pour ce siècle.

> ne donne de prévisions météorologiques à long terme. Évaporation

plus élevés de la fin du printemps au Chaque mois, Environnement Canada établit la prévision du niveau des lacs pour les six prochains mois. relevés antérieures de l'apport en eau résultant des précipitations, du ruissellement des terres avoisinantes et de l'évaporation. On prévoit trois possibilités: un apport d'eau moven. un apport élevé et un apport peu élevé. Pour prévoir le niveau des possibilités en tenant compte du niveau actuel des lacs (pour la nériode visée par la prévision); on evamine les plans de régularisation des dispositifs de la rivière

passant d'un lac à l'autre. De cette facon, on peut estimer le niveau le plus probable des lacs pour les six prochains mois, ainsi que l'ampleur probable des variations. Il est toutefois toujours possible que les niveaux dépassent les limites prévues.

Il importe de noter que cette prévision ne tient actuellement pas compte de facteurs tels que la hauteur de neige au sol, le degré d'humidité ou de sécheresse du terrain du bassin hydrographique, ni

Les prévisions effectuées à partir des niveaux actuels montrent que cet été, en cas d'apport d'eau moven, le niveau de tous les lacs baissera de 10 à 20 cm par rapport

S'il y a assez de précipitations au cours du printemps, les niveaux des lacs pourraient cet été avoisiner ceux de l'été dernier ou les dépasser quelque peu. Si, par contre, c'est un temps sec qui prévaut, ces niveaux seront nettement en dessous des niveaux de l'été dernier.

Pourquoi le niveau des lacs balsse-t if st rapidement depuis 1986?

Le niveau des Grands Lacs varie selon le climat de la région. De 1967 à 1986, le niveau des lacs est resté au dessus de la moyenne, car le taux de précipitations du bassin des Grands Lacs était systématiquement plus élevé que la movenne. Le niveau excentionnellement élevé des précipitations en 1985 a porté, en 1985 et 1986, le niveau des lacs au-dessus du record enregistré jusque-là au 20e siècle. Depuis octobre 1986, on enregistre un baisse rapide, sans précédent, des niveaux d'eau. Cette baisse est la conséquence du peu de précipitations de l'hiver 1986-1987, puis des printemps 1987 et 1988.

Cette baisse a été d'autant plus spectaculaire que le niveau des lacs était exceptionnellement élevé à la fin de 1986 (sauf le lac Ontario). La baisse du volume d'eau du hassin des Grands Lacs qui a eu lieu entre novembre 1986 et novembre 1987 s'est élevée au chiffre record de 560 km3. Cette baisse dépasse le record établi en 1930-1931, qui s'élevait à 490 km3.

En 1987, le taux de ruissellement estimé du bassin du lac Supérieur s'élevait à seulement un tiers de la movenne et celui du bassin des lacs Michigan et Huron, à la moitié de la moyenne. Au cours de la sécheresse de 1988, le taux d'évaporation au dessus des Grands Lacs, notamment des lacs Michigan et Huron, était élevé.

Le niveau du lac Ontario a également baissé en 1987-1988 en raison de l'apport réduit d'eau des lacs de la région supérieure, mais cette baisse a été beaucoup moins

Étude sur le niveau des Grands Lacs de la commission mixte internationale

La Commission miyte internationale (CMI) est une organisation binationale mise sur pied par le Traité de 1909 sur les eaux limitrophes. Cette Commission est chargée des questions concernant les eaux limitrophae du Canada et des États-Unis. Elle recoit son mandat des gouvernements fédéraux respectifs. Le 1er août 1986, les gouvernements du Canada et des États-Unis ont chargé la Commission mixte internationale d'étudier les movens de remédier aux problèmes occasionnés par les fluctuations du Diveau du bassin des Grands Lacs et du Saint-Laurent. Le rapport de situations présenté par la CMI en août 1989 constitue la première partie de cette étude. Ce rapport comprend un Sommaire, un Rapport principal et sept Addenda portant sur des sujets précis. Ce rapport a été distribué aux bibliothèques et à divers organismes du bassin des Grands Lacs. Pour en obtenir une liste,

Le 9 février 1990, la Commission a approuvé une directive portent sur la création d'un Conseil d'étude du renyoi sur les niveaux. Ce Conseil. composé de neuf membres, est chargé de terminer la phase II de l'étude commencée en 1986. Les membres de ce Conseil comprendent un directeur d'étude, deux représentants d'organismes fédéraux. quatre représentants d'organismes provinciaux ou d'État, et deux représentants de groupes non gouvernemental ou de citovens.

téléphonez à Alan Clarke, au bureau

995-2984, ou à Frank Bevacqua, au

de la CMI à Ottawa au (613)

bureau de Washington, au (202)

Précipitation su le bassin des Grands Lacs



Le rôle principal du Conseil d'étude consiste à s'assurer que toutes les études effectuées dans le cadre du rapport scient terminées et à préparer un rapport définitif qui permette à la Commission de connaître les résultats

Le directeur d'étude est chargé de siéger à ce Conseil et d'aider ses membres à réaliser leurs objectifs.

On a demandé à la CMI de soumettre au Conseil un plan d'étude de la phase II d'ici la mi-mai. Ce plan d'étude abordera notamment les objectifs suivants de la phase II:

- établir des lignes directrices que la Commission pourrait proposer aux gouvernements. afin de les aider à résoudre les problèmes que pose la fluctuation des niveaux d'eau-
- mener des études à court terme dans plusieurs domaines. afin de développer ces principes;
- -évaluer un éventail de mesures de gestion s'appliquant à divers emplacements typiques du

La Commission a pris l'engagement de faire participer le public et les membres de groupes d'intérêts divers au processus d'étude de la phase II. La CMI a encouragé la participation du public, en nommant au Conseil d'étude deux membres qui ne font pas partie du gouvernement. En outre, on a créé un Comité consultatif de citovens pour aider le Conseil à concevoir des programmes qui feront participer le public à la phase II.

Le Conseil publiera un rapport bimestriel faisant état des progrès et des problèmes éventuels. Ces rapports seront présentés à la Commission. Tous les rapports, les comptes rendus de réunions et les documents préparés par le Conseil pourront être consultés par le public.

Enquête sur les propriétaires riverains

Vous êtes-vous jamais demandé combien de nersonnes vivent au bord des Grands Lacs? Grâce à une enquête qu'Environnement Canada a entrepris auprès des propriétaires riverains des Grands Lacs et du Saint-Laurent, nous connaîtrons bientôt la réponse. L'U.S. Army Corps of Engineers effectue une enquête analogue aux États-Unis.

Dans la cadre de ce recensement Environnement Canada a récemment envoyé un questionnaire à quelque 24 000 propriétaires riverains canadiens des Grands Lacs, choisis au hasard. Cette enquête devrait permettre de connaître les expériences des propriétaires riverains au suiet des variations du niveau d'eau, de mieux comprendre leur opinion sur la nuestion et de savoir les solutions qu'ils envisagent pour résoudre les problèmes liés aux niveaux d'eau extrêmement élevés ou



Une enquête analogue, menée actuellement aux États-Unis par l'U.S. Army Corps of Engineers, permettra de procéder à une analyse globale du bassin. Celle-ci sera utile à la phase II de l'Étude aux termes du renyoi à la Commission mixte internationale sur le niveau des Grands Lacs.

aux propriétaires riverains de participer à la

Groupe de travail des

planification du bassin.

Le 21 mars 1990, les membres d'un groupe de travail, composé de personnes nommées et de représentants du pouvernement et d'autres organismes américains et canadiens, ont participé au deuxième des quatre ateliers des communications organisés par la CMI. Ce groupe de travail a pour mission d'aider la Commission mixte internationale à remplir le mandat de l'étude d'août 1986, qui demandait à celle-ci d'élaborer un programme d'information qui puisse être mené par les organismes nouvernementaux responsables et qui permettrait de mieux informer le public sur les variations du niveau des lacs.

Ce groupe de travail élabore des projets de communications précis sur le niveau des lacs, ainsi qu'une série de recommandations concernant la réalisation de ces projets et qui pourraient être présentées aux gouvernements du Canada et des États Unis.

Un rapport préliminaire fondé sur les résultats des deux premiers ateliers sera envoyé à un Comité de révision de l'un et de l'autre des pays aux fins de commentaires. Le programme définitif d'information devrait être disponible d'ici l'automne 1990.

Amélioration en matière de réglementation des lacs Au cours de l'automne 1989, le Conseil de contrôle du lac Supérieur de la CMI a terminé une étude concernant les améliorations à apporter au plan de réglementation de 1977 du lac Supérieur. Un rapport à cet égard à été soumis à la CMI. Un comité de travail du Conseil de contrôle du fleuve Saint-Laurent examine également les possibilité d'améliorer le plan de régulation 1958-D du lac Ontario.





Port Franks, lac Huron printemps 1987

AUTRES ACTIVITÉS

Programme d'établissement de cartes des zones d'inondation et d'érosion du littoral

Dans le cadre du programme Canada/Ontario de réduction des dommages causés par les inondations, les organismes locaux de conservation établissent actuellement la carte des zones menardes les inondations ou l'érosion pour certains rivages des Grands Lans Les photographies aériennes du littoral sont terminées et on gréssion

Conférence de l'Association canadienne des ressources hydriques de l'Association américaine des ressources hydriques

Plusieurs articles techniques sur la question du niveau des lacs on présentés à la conférence qui a réuni du 1er au 4 avril 1989 à Toronto, les associations des ressources hydriques du Canada et de États-Unis. Ces communications s'inspiraient de travaux effectuée. de la phase I de l'étude sur le niveau des lacs de la CMI. On neus obtenir un comote rendu de cette conférence, movennant qualque frais, en s'adressant à M. J. Fitzgibbon, de l'Université de Gualdo Centre des communications du niveau des Grands Lacs, sis à Burlington, met à la disposition du public des copies individualles de ces communications.

Nouvelle brochure sur la réglementation des Grands Lacs Une nouvelle brochure destinée au public et portant sur la

réglementation des Grands Lacs et du Saint-Laurent sera bientit publiée. Réalisée à la fois par énvironnement Canada et l'U.S. Arm Corps of Engineers, cette brochure donne la date d'entrée en vious de la réglementation des lacs Supérieur et Ontario ainsi que la raiss pour laquelle cette réglementation existe, la façon dont elle fonction ainsi que les avantages et les limites des systèmes actuels de réglementation.

Étude sur la gestion du littoral de la Pointe Pelée

La région de la Pointe Pelée connaît depuis longtemps de sérieux problèmes d'érosion et d'inondation. Ces problèmes ont des répercussions sur les habitations du littoral, les terres cultivées, les parcs et les zones marécageuses.

Une étude de planification mettant en jeu l'administration municipal les gouvernements provinciaux et le gouvernement fédéral ainsi qu des organismes locaux de conservation a été amorcée afin d'élabo un plan de gestion pour les rives du lac Érié, de Port Crewe à l'extrémité de la Pointe Pelée. Cette étude inclut les zones intérie menacées par la crue du lac Érié.

La portée et le financement de ce projet n'ont pas encore été éla mais les organismes gouvernementaux ont jusqu'à maintenant app un grand soutien.

Pour plus de renselanements:

Centre des communications du niveau des Grands Lacs Environnement Cat 867 Lakeshore Road, C.P. Box 5050 Burlington (Ontario)

(416) 336-4581 S'il y a des sujets que vous voulez voir traiter dans les prochains miméros d'envol, veuillez également vous adresser à ce centre.

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Source: National Oceanic and Atmospheric Administration



Volume 3, Number

January 13, 1995

Some Problems, But Conditions Generally Favourable

1994 Good Year On Great Lakes

Conditions on the Great Lakes and St. Lawrence River were relatively trouble-free in 1994, despite a near-record ice cover through the winter and two wind storms on Lake Erie in the fall.

Thick ice on Lake Erie and in the St. Clair-Detroit Rivers in January and February caused some winter problems for local vessels.

But, ice jams and accompanying flooding that were feared in the spring did not materialize, as a gradual melt allowed for even dissipation of the ice cover.

Except for low St.
Lawrence River levels,
which caused some
problems with late removal

of pleasure boats in October, recreational boating on the Great Lakes was generally good throughout the season.

Although extensive ice cover slightly delayed the start of the 1994 navigation season, above normal temperatures and late ice formation in December allowed for a later-than-usual Seaway closing date. The last downbound ship cleared the Snell Lock near

Cornwall on December 28. The Welland Canal remained open until December 30.

Two storms on Lake Erie in November did not cause serious shoreline damage, because the lake's level was sufficiently low to allow for resulting storm surges. Despite maximum wind gusts of 110 km per hour, the lake did not rise above its critical level on either occasion. (Continued on Page 2)

Lake Level Update

The Great Lakes began the New Year at levels very close to those of the same time in 1994. Lakes Superior and Ontario continued at their long-term average levels, while the other lakes remained between 20 and 25 cm above their averages

Assuming average water supplies, Lakes Michigan-Huron, St. Clair and Erie are forecast to remain above their averages for the next six months, while Lakes Superior and Ontario are expected to maintain their near-average trends.

(Continued from Page 1)
Flows from Lake Superior were reduced below those prescribed by its regulation plan to allow for repairs to hydropower facilities at Sault Ste. Marie. This resulted in approximately 2 cm of stored water on that lake and a one cm lowering of Lakes Michigan-Huron by the end of October.

Deviations from Lake Ontario's regulation plan resulted in 6 cm of stored water on that lake by the end of July.

Flows from both lakes were increased in December to offset the accumulated water storage.

The above information is adapted from A Report on the 1994 Water Levels of the Great Lakes and St. Lawrence River, which will soon be available upon request.

Erie-Niagara Ice Boom

Unseasonably warm temperatures delayed installation of the Lake Erie-Niagara River ice boom until early January.

The boom helps prevent ice jams in the Niagara River. It is usually in place by mid to late December.

Improvements To Regulation Plan

Board Assesses Possibilities

The International St.
Lawrence River Board of
Control is assessing
potential improvements to
the regulation of Lake
Ontario's outflows.

One potential plan, called Plan 35-P is a product of the International Joint Commission's Levels Reference Study, which was completed in March of 1993.

The second plan, called IS-4, uses an "optimization" technique, which attempts to achieve the best possible

compromise to serve a combination of purposes.

Both potential plans take into consideration the needs and preferences of hydropower, navigation, recreational boating, shoreline property and environmental interests.

Over the next three years, the Board will simulate water levels and flows that could be generated by each of these plans.

The existing regulaton plan will remain in effect during this period.

FOR MORE INFORMATION

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Editor, Ruth Edgett

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Volume 3, Number 2

February 6, 1995

Lakes Still Close To Annual Lows

Wet Weather Raises Erie And Ontario

An unusually mild and wet beginning to 1995 helped push Lakes Erie and Ontario into their seasonal rises.

Preliminary figures show that Lake Erie received 164% of its average January precipitation, while Lake Ontario received 107%. Lake Superior was observed to have had only 60% of its January snow and rainfall, while Lakes Michigan-Huron had 95%.

January flood advisories were issued for inland rivers and streams in some areas. Because the lakes are at or near their lowest levels for the year, they have absorbed the additional water supplies without significant rises.

A continuation of unseasonably mild weather continued to delay ice formation on the

Great Lakes and St.
Lawrence River. Ice cover was negligible by the end of January. This was a near reversal of conditions on the Great Lakes at the same time last year, when extremely cold weather caused a near-record ice cover.

Lakes Superior and Ontario began January at their average water levels for the time of year. Lake Superior stayed near average. Lake Ontario took a slight dip early in the month, but later rose to end the month at 13 cm above average.

Lakes Michigan-Huron, St.

Clair and Erie ended the
month between 20 and 40

Very above their long-term
averages. This
represented a 10 cm rise
in Lake Erie's level.

Two Open Houses For Niagara Area In March

The Niagara Peninsula Conservation Authority is working with the Great Lakes Water Level Communication Centre to offer open houses in Beamsville and Port Colborne on March 7 and 14.

Representatives from the CA and the Communication Centre will be on hand to explain the current lake level situation and how shoreline property owners can reduce their vulnerability to flooding and erosion.

The events will be held March 7 in the Lincoln Town Hall, Beamsville, and March 14 at the Port Colborne Public Library. Both sessions will run from 7 to 9 p.m. See you there!

Please Return Your Survey Card

Water Level Bulletin & Level News Combine Efforts To Serve You Better

Beginning this month, the Great Lakes Water Level Communication Centre and the Canadian Hydrographic Service have combined our monthly mail-outs.

This allows us to serve more people and make the most efficient use of resources.

Previously, the Canadian Hydrographic Service of Fisheries and Oceans Canada mailed its Water Level Bulletin to one mailing list, while Environment Canada maintained another list of people who received both the Bulletin and its monthly newsletter, the *Level News*.

Please Complete Enclosed Survey

This amalgamated mailing has taken the Water Level Bulletin and *Level News* to some 3,700 homes and offices in the Canadian portion of the Great Lakes-St. Lawrence River Basin. To help us refine our list,

we ask you to take a few moments to complete and return the enclosed survey card. If you do not return the card by the end of March, we will assume that you do not wish to continue receiving the Water Level Bulletin and Level News.

Readers may be added to the list by telephoning (905) 336-4581, or (905) 336-4844.

Boards Planning Public Meetings

The International St.
Lawrence River Board of
Control, the International
Lake Superior Board of
Control, and the
International Niagara
Board of Control are
planning to hold meetings
with the public within the
next few months.

These annual meetings allow citizens to learn more about the boards' operations, and to express their views.

Watch for details in the March mailing.

FOR MORE INFORMATION

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Editor, Ruth Edgett

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Volume 3, Number 3

March 8, 1995

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Levels Reference Study Update

Canada Responds To IJC's '94 Repor

The Canadian
Government has
responded to the
International Joint
Commission's 1994
report on ways to deal
with changing Great
Lakes-St. Lawrence
water levels.

In a document transmitted to the Commission by Foreign Affairs Minister André Ouellet, the Government outlined responses to each of the recommendations contained in the Commission's March 1994 report.

Action Planned

Among planned actions are moves to restrict placement of fills in boundary waters and to address existing fills in the Niagara River.

Environment Canada will continue to provide emergency water level

information and to inform citizens about how the Great Lakes-St. Lawrence system works through its information office in Burlington.

Shoreline Management

The Government endorsed the Commission's recommendations urging comprehensive shoreline management as the principal means of alleviating shoreline damage. It also supported the Commission's call for an ecosystem approach to managing water levels.

Other IJC News

The Commission has increased to 10 the number of members on its International St. Lawrence River Board of Control.

Mayor Peter B. Yeomans of Dorval, Québec, and Dr. Frank Sciremammano of Rochester, New York, will fill the two new Board positions.

Their three-year appointments were effective February 8.

Meanwhile, after considering a recommendation for a Great Lakes-St. Lawrence River Advisory Board, the Commission, "has decided not to establish such an advisory board at this time."

Board Meetings

Plan to attend the following meetings with the public:

- International St. Lawrence River Board of Control, Dorval, Québec, May 15.
- International Lake Superior Board of Control, Sault Ste-Marie, Ontario, June 27
- International Niagara River Board of Control, Niagaraon-the-Lake, September 28.

All sessions will be held in the evening. Details on exact times and places will follow in future issues of *Level News*.



Environment Canada Environnement Canada Canadä

It's Not Too Late To Get On the List

Readers Appreciate The Information

To date, nearly 1,300 people have indicated they wish to remain on the mailing list for the <u>Level News</u> and the monthly <u>Water Level</u> <u>Bulletin</u>.

Readers have until the end of March to indicate whether they

would like to continue receiving the package. After that date, those who have not responded will be removed from the mailing list. You can respond by returning the survey card that was included in your package last month, by sending a note to our address

below, or by telephoning (905) 336-4629.

More than 250 respondents made comments or asked questions. The vast majority felt the newsletter and water level bulletin are useful; some even offered to pay for the service. An annual subscription fee may be considered at some point in the future.

Lake Level Update

Water levels of Lakes Superior, Michigan-Huron, St. Clair and Erie declined in February, while Lake Ontario's level remained unchanged.

Lake Superior began March at 7 cm below its seasonal average, while Lakes Michigan-Huron, St. Clair, Erie and Ontario were all above their averages by 13, 21, 28 and 10 cm respectively.

Precipitation over the Great Lakes basin in general was about 20% below its average for February. Lake Superior received more precipitation than average, while the other lakes received less than their averages for the time of year.

Lake Ontario is expected to rise in the next several weeks, but below average snow pack means that the seasonal increase will probably not be dramatic. Water levels on the middle Great Lakes are forecast to begin their seasonal rise sometime in March. Unless extremely wet conditions occur, the possibility of significant flood or erosion damage will be low.

Generally warmer temperatures than last winter have left the Great Lakes with a light ice cover. Mostly open water is forecast for Lake Erie by mid-March, and Lake St. Clair's ice cover is forecast to be well into its spring decay by that time.

Open Houses

Learn more about lake levels and shoreline hazards at:

Port Colborne Public Library, March 14 from 7 to 9 p.m. A similar open house was held in Beamsville on March 7.

Contact: Niagara Peninsula Conservation Authority, (905) 227-1013.

FOR MORE INFORMATION:

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Editor, Ruth Edgett

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Volume 3, Number 4

April 7, 1995

Minister Announces Computerized Service

Find Us On The Information Highway

The <u>Level News</u> and the <u>Water Level</u> <u>Bulletin</u> are now available on the Internet, the world-wide computer network that daily helps people exchange information around the globe.

"The Internet is an increasingly popular means of exchanging information; the number of users is growing daily. We see an opportunity to reach out to a growing audience while keeping our publication costs as low as possible," says Ralph Moulton of Environment Canada's Great Lakes-St. Lawrence Water Level Information & Geomatics Office. The two publications will continue to be produced on paper as well.

The effort by the Information & Geomatics Office, together with the Canadian Hydrographic Service, is one small part of a larger effort to make environmental information available to Internet users around the world.

Copps Announces Green Lane

On March 27, Sheila Copps, Deputy Prime Minister and Minister of the Environment, announced Environment Canada's "Green Lane" on the information highway in Ontario. The Green Lane makes environmental information instantly accessible around the world, 24 hours a day.

A major component of this contribution is the Great Lakes Information Management Resource -- or GLIMR for short *(pronounced "glimmer")*. This constantly evolving service provides a virtual library of information about Environment Canada's Great Lakes programs, publications and databases. Here, you will find the *Level News* and the *Water Level Bulletin* along with a variety of other information on such things as Great Lakes water quality and water conservation.

If you have access to the World-Wide Web, you can enter GLIMR and the Green Lane using either of the following codes:

http://csx.cciw.ca/glimr/topic-browse/graphic-mode/water-general/intro.html

http://www.cciw.ca/green-lane/intro.html

From these points, you can explore environmental computer networks all over the world, including GLIMR's United States counterparts. GLIMR's user-friendly combination of text and graphics helps everyone from scientists to students find Great Lakes information.

Instant Environmental Information

"Our government is committed to ensuring a healthy environment for a healthy economy and healthy Canadians", said Minister Copps while demonstrating GLIMR to high school students in Hamilton on March 27. "Our Green Lane on the information highway is an innovative way of instantly providing Canadians with information needed to make sound environmental decisions and take action."

Environment Canada's Ontario Green Lane also allows access to information on regional weather, climate, atmospheric research, and the National Water Research Institute.

Lake Level Update

Spring conditions are shaping up favourably on the Great Lakes, and the risk of flooding or erosion due to spring storms diminishes as summer approaches.

Lakes Superior and Ontario began April slightly below their seasonal averages, while Lakes Michigan-Huron, St. Clair and Erie were between 10 and 20 cm above their average levels for the time of year. This compares favourably with beginning-of-April levels in 1994.

Water Supplies Lower Than Usual

A light snow pack on the Great Lakes basin and below-average precipitation for the second month in a row resulted in water level increases that were slightly less than the usual seasonal rises for March. However, these increases are expected to continue for at least the next several weeks.

In all, the Great Lakes basin received 79% of its usual March precipitation. Lake Superior received 89%; Lakes Michigan-Huron, 84%, Lake Erie, 65%, and Lake Ontario 53%.

Navigation Season Opens

A light ice cover on the Great Lakes -St. Lawrence and a warming trend through March allowed the St. Lawrence Seaway to open a week early on March 24.

Board of Control To Meet Public

The International St. Lawrence River Board of Control will host a meeting with the public at 7 p.m., Monday, May 15, at Sarto Desnoyers Community Centre, 1335 Lakeshore Road, Dorval, Quebec.

Public Access

If you don't have a computer at home or school, you are welcome to cruise the environmental "Green Lane" with the public access terminal at the Canada Centre for Inland Waters in Burlington, Ontario.

"Communication via computer may be the way of the future, but we recognize that many people still don't have direct access to this technology," explained Ralph Moulton, Manager of the Information & Geomatics Office.

The terminal is located on the main floor of the Canada Centre for Inland Waters in Burlington. Visitors are welcome to try their

hand at cruising the information highway. Please call ahead, write or e-mail (see contact information at right) to make an appointment for a complementary introduction to .GLIMR and the World-Wide Web. Individuals and groups are welcome.

Name Change

You may have noticed that the name of our office has changed. What used to be the Great Lakes Water Level Communication Centre is now the Great Lakes-St. Lawrence Water Level Information & Geomatics Office (Information & Geomatics Office for short).

The name change represents an amalgamation of two services offered from Environment Canada 's Burlington location: The water level information service, and the geographic information systems (GIS) service. The term "geomatics" in the new name refers to computerized systems that make use of geographic information. This includes the GLIMR project, which is led by the geomatics group.

Info Source

The Information & Geomatics
Office continues to specialize in
Great Lakes-St. Lawrence water
levels and flows, as well as
geographic information about
the basin and its shorelines. We
also stock publications on other
Great Lakes-St. Lawrence
topics and can help locate other
sources of information. The
addition of a public access
terminal for GLIMR and the
World-Wide Web further
enhances this service. So, call,
write or drop in!

FOR MORE INFORMATION:

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Editor, Ruth Edgett

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Volume 3, Number 5

May 8, 1995

Board Of Control Tries To Help

Low St. Lawrence Worries Mariners

Three months of below-average water supplies could mean a disappointing start to the recreational boating season on Lake Ontario and the St. Lawrence River.

No Seasonal Rise

"Lake Ontario's level has remained virtually unchanged for the past three months, when it normally would have risen some 35 cm," said Peter Yee of Environment Canada's Great Lakes-St. Lawrence Regulation Office in Cornwall.

"The water level at the beginning of May was 30 cm lower than it was at the same time last year," he said, adding: "We have received a number of calls from concerned marina operators who are worried about how these low levels will affect the boating season."

Outflows Reduced

In an effort to conserve water on Lake Ontario, the International St. Lawrence River Board of Control authorized reduced outflows from the lake. However, since the decreased flows lower the level at Montréal Harbour, this measure is undertaken when it will not interfere with commercial vessels in the Harbour.

Port Level Falls

Water levels at Montréal dipped to near record lows in April due to low flows from Lake Ontario and the Ottawa River. Port officials said some deep draft commercial vessels were forced to leave some of their cargo behind due to reduced depths in

Meet The Boards

The International St.
Lawrence River Board of
Control will meet the public on
Monday, May 15 at 7 p.m. at
the Sarto Desnoyers
Community Centre, 1335
Lakeshore Road, Dorval,
Quebec.

The International Lake
Superior Board of Control will
meet the public on Tuesday,
June 27, at 7 p.m. at the Civic
Centre, 99 Foster Drive, Sault
Ste. Marie, Ontario.

For more information, contact Peter Yee at (613) 938-5725. the harbour; others had to detour to deeper ports in the Maritimes.

Lake Ontario's level rose by about five cm during the latter half of April. About one cm of this can be attributed to the flow reductions.

Slight Rise To Come

Levels of Lake Ontario and the St. Lawrence River between Kingston and Cornwall are expected to rise by small amounts until June or early July. This should improve boating conditions somewhat.

However, water levels downstream of Cornwall, including Montréal Harbour, will likely continue to decline due to reductions in Lake Ontario's outflow and declining flows from the Ottawa River.

Lakes Lower Than '94

The other lakes have also experienced lower-than-average supplies for much of the past three months. As a result, all of the lakes have lower levels than those recorded at the same time a year ago.

Lake Level Update

Other Lakes Look Good For Summer

Despite concerns about low water level problems on Lake Ontario, boating conditions on the other Great Lakes and Lake St. Clair are likely to remain favourable for the remainder of the summer. Swimmers and sunbathers can also expect to find ample beaches in many areas. The risk of flooding on all the Great Lakes remains very low.

With the exception of Lakes Ontario and Superior, the lakes rose during April in keeping with the increase in levels that occurs every spring. However, the middle lakes and Lake St. Clair did not increase at their usual pace. All the middle lakes and Lake Superior were 10-15 cm below their levels recorded at the same time a year earlier.

Nevertheless, all of these lakes, with the exception of Lakes Superiorand Ontario, remain above their long-term average levels for the time of year.

The Great Lakes-St. Lawrence Basin received 117% of the average precipitation for April. Lake Superior's drainage basin received 97%; Lakes Michigan-Huron, 133%; Lake Erie's basin (which includes Lake St. Clair), 126%; and Lake Ontario, 73%.

If water supplies are near average for the next few months, all of the lakes are expected to continue their seasonal rises through June and July. Lower-than-average supplies could slow or stop these annual water level increases.

Open House On Shoreline Management

If you have property between Evans Point and Mohawk Bay on Lake Erie, plan to attend an Open House on Saturday, May 27.

The Grand River Conservation Authority will host this opportunity to learn more about how shoreline management planning will affect you. The event will take place at the Town of Dunnville Recreation Centre between 11 a.m. and 4 p.m.

For more information, contact Joe Farwell or Gloria Yeung at the Grand River Conservation Authority (519) 621-2761.

CA Seeks Shore Watchers

If you live on Lake Ontario or Lake Erie shoreline that falls within the boundaries of the Niagara Peninsula Conservation Authority, you may be able to help the CA gather information about storm events by volunteering as a "Shore Watcher".

The only qualifications you need to participate in the Shore Watch program are an interest in your shoreline and a telephone.

To find out more, contact David Watson at the Niagara Peninsula Conservation Authority at 1-800-263-4760, extension 237.

Please Return Survey Card

If you are among subscribers who receive the Water Level Bulletin from spring to fall only, please remember to return the survey card you received last month, if you want to stay on the mailing list.

If you can't find the card, or if you did not receive one, you

may continue your subscription by telephoning (905) 336-4629.

If we don't hear from you by the end of May, we will assume that you no longer wish to continue receiving the Water Level Bulletin and Level News.

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Editor, Ruth Edgett

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Volume 3, Number 6

June 9, 1995

Some Rise In Levels Still Likely This Summer

Lakes Still Lower Than In June 1994

Water levels of the Great Lakes rose in May, although all the lakes began June between 10 and 30 cm lower than they were at the same time last year.

In comparison to their long-term averages, Lakes Superior and Ontario began the month between 12 and 20 cm below their means for the time of year. Lakes Michigan-Huron, St. Clair and Erie started the month between 5 and 15cm above average.

Lake Superior's level reached chart datum in March and April but began to recover in May as additional rainfall allowed the lake's seasonal rise to continue.

Low Superior Levels

Lower-than-average water levels on Lake Superior translated to lower flows in the St. Marys River. In April, periods of easterly winds caused some delays to ships when the river's level fell below chart datum. The May rise in Superior's level helped alleviate these problems.

Assuming average water supplies, the levels of Lakes Superior, Michigan-Huron and CO Ontario are expected to rise by

15, 5 and 10 cm respectively over the next two months. The levels of Lakes St. Clair and Erie are expected to begin their seasonal declines within the next month.

Extremely wet or dry weather could cause water levels to rise above or fall below those forecast.

Preliminary figures show the Great Lakes-St. Lawrence Basin received 89% of average precipitation for May. Lake Superior received 103%; Lakes Michigan-Huron,82%; Lake Erie and Lake St. Clair), 104%; and 1995 ake Ontario, 68%. These figures are subject to revision.

Low Levels And Flows Cause Concern

St. Lawrence Board Meets Citizens

Concern about low water levels was the main topic of discussion at a recent public meeting of the International St. Lawrence River Board of Control.

Approximately 50 citizens met the Board at a community centre in Dorval, Quebec, on May 15. Shoreline property owners and boaters alike expressed concern about lower-than-average spring water levels in the Lac St-Louis and Montréal areas of the St. Lawrence River.

Board representatives explained that lack of precipitation on the Lake Ontario basin through the winter and spring caused low lake levels and outflows. The Ottawa River, which meets the St. Lawrence River near Montréal, also experienced below-average flows.

Port Level Rises

After plunging to a 30-year low for the month of April, the Port of Montréal's level rose in May due to increased rainfall and higher outflows from the Ottawa River system. The increased water supplies also caused a rise in the level of Lac St-Louis.

The additional supplies helped the harbour recover from low levels that had earlier forced some departing ships to leave cargo behind and some incoming vessels to detour for deeper ports.

Difficult Beginning

The recreational boating season in the Montréal and Thousand Islands areas got off to a difficult start in May due to lower-thanaverage water levels. But the rise in levels later in the month helped ease boaters' concerns somewhat.

Nevertheless, water levels on Lake Ontario and in the Montréal area of the St. Lawrence continue below their averages for the time of year.

In April the Board of Control began reducing Lake Ontario's outflow in an effort to conserve water on the lake.

However, the effectiveness of this measure has been limited by the need to minimize low water problems for shippers and recreational boaters in the Montréal area, as well as by high water levels immediately upstream of the regulation structure.

High Water Level

Low flows through the power dam at Cornwall caused high water concerns on Lake St.

Lawrence immediately upstream of the dam. While river levels in the Montréal area continued below average, Lake St. Lawrence residents saw a dramatic rise, which led to concerns about flooding of docks.

Be Prepared

"The variability in St. Lawrence River levels should be a signal to boaters that they need to plan ahead for fall," cautions Peter Yee.

"Don't wait until the last minute to see if water levels will allow you to get your boat out at the same place you brought it in."

Testing Changes

The International St. Lawrence Board of Control has been running computer similations of two potential improvements to Lake Ontario's regulation plan.

One prospect, called Plan 35-P is a refinement of the existing regulation plan, 1958-D. It is a product of the International Joint Commission's Levels Reference Study, which was completed in 1993. The second, called Plan IS-4, uses an "optimization" technique to achieve the best possible compromise among the needs of various interests.

Considers Interests

Both potential plans take into consideration the needs and preferences of hydropower, navigation, recreational boating, shoreline property and environmental interests.

The regulation plan simulations will continue for the next three years. The existing regulation plan will remain in effect during this period.

Superior Board

The International Lake Superior Board of Control will meet the public on **Tuesday**, **June 27**, **at 7 p.m.** at the Civic Centre, 99 Foster Drive, Sault Ste. Marie, Ontario.

For more information, contact Peter Yee at (613) 938-5725.

Niagara Board

The International Niagara Board of Control will host an open house on **Thursday**, **September 28 at 7:30 p.m.** at Navy Hall on Ricardo Street, Niagara-on-the-Lake.

For more information contact Len Falkiner at (905) 336-4947.

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Editor, Ruth Edgett

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Volume 3, Number 7

July 7, 1995

Lake Level Update

Ontario & Erie Reach Peaks For Year

Water levels on Lakes Erie and Ontario reached their annual peaks in June and are expected to soon begin seasonal declines that will last through late winter.

Last month's forecast indicated that Lake Ontario's level could continue to rise through July. However, light precipitation over the lake's drainage basin kept the water level close to where it was at the beginning of June.

"Lake Ontario began July at 13 cm below its average for the time of year," said Peter Yee of Environment Canada's Great Lakes-St. Lawrence Regulation Office in Cornwall.

Boating Problems

"The seasonal decline means that recreational boaters will probably continue to have difficulties with low water levels in the St. Lawrence River, eastern Lake Ontario and Lac St-Louis for the duration of the season."

Lake Ontario outflows have been reduced since April in an attempt to conserve water on the lake.

Meanwhile, Lakes Michigan-Huron remained near their average level for the beginning of July. Lake St. Clair started the month at 15 cm above its longterm average. Lake Superior's level stayed below average. (See below for details.)

FEB / 1998

Board Meets Public

Superior Well Below Average

Lower-than-average water levels for Lake Superior, and water for the St. Marys Rapids fishery were key discussion topics at the International Lake Superior Board of Control's annual public meeting on June 27.

About 15 citizens turned out at the Civic Centre in Sault Ste. Marie, Ontario, to hear Board representatives explain how a dry winter and spring combined to keep the lake's level 20 cm below its seasonal average by the end of June. As a result of the low water level, Lake Superior's regulation plan calls for reduced outflows. Nevertheless, the lake will likely remain below average for the next six months.

The low Lake Superior levels have caused navigation, launching and docking problems for recreational boaters. March levels even lower than June's also posed problems for commercial shipping (see May Level News).

The public meeting was also told about a proposed field test by the St. Marys River Remedial Action Plan (RAP) to identify flow patterns to enhance fish habitat in the rapids area. The test would experiment with various gate settings at the Compensating Works in order to redistribute the flow of water to the rapids. If funding is approved, the test will take place this summer.

Measurements at Niagara

Staff from Environment Canada and the U.S. Army Corps of Engineers spent several days in April and May measuring flows at various points in the Niagara River.

The measurements were part of a regularly-scheduled program to verify continuous flow measurements by gauges used for international water management, and to determine the amounts of water available for various uses under the Niagara Treaty of 1950.

This Canada-U.S. Treaty allocates Niagara water for domestic and sanitary uses, navigation, flows over the Falls and hydropower generation.

Standard current meters were used to measure flows at the Robert Moses Cableway in the lower river, the American Falls

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June Precipitation Over Great Lakes

As a percentage of the long-term June average:
Great Lakes Basin, 49%
Lake Superior, 33%
Lakes Michigan-Huron, 48%
Lake Ontario, 39%

NOTE: These figures are preliminary.

and the International Railway Bridge.

Measurements are scheduled every three years at the Cableway and Railway Bridge, and the American Falls meausrements are taken every five years.

Similar measurements are taken, normally every three years, at the Welland Canal Supply Weir. For purposes of the 1950 Treaty, these measurements determine the amount of water entering the Canal. The next Welland Canal measurements are planned for late 1995 or early 1996.

Staff Gauges In St. Lawrence

If you are a recreational boater on the St. Lawrence River, you may have daily access to water level information at your marina.

In 1994, Environment Canada's Great Lakes-St. Lawrence Regulation office installed staff gauges at a number of marinas along the river. These gauges show changing water levels in the river as they occur.

The gauges have been installed at Iroquois, Crysler, Long Sault and Cornwall marinas.

Measurements are given in metres and centimetres above chart datum.

Ask your marina operator whether there is a staff gauge at your location.

Find This Info On The "Web"

If you have a computer connection to the World-Wide Web, you can find the Water Level Bulletin and *Level News* electronically.

Through Environment Canada's Green Lane on the Information Highway, you can also access a wide range of other environmental and Great Lakes information.

You can find the Water Level Bulletin and *Level News* through the Great Lakes Information Management Resource (GLIMR) at URL:

http://www.cciw.ca/glimr/intro.html

Once you are in GLIMR, choose the "Topic" button; then choose "Water General"; then choose "Water Levels and Flows". You can also browse through GLIMR for a variety of other Great Lakes information.

If you want other kinds of environmental information, try this URL:

http://www.cciw.ca/greenlane/intro.html



CA1 MT 160 - G 64

LAKES-ST. LAWRENCE RIVER WATER LEVELS



Volume 3, Number 8

August 9, 1995

Lakes Superior and Ontario Improve

Late July Rain Helps Lake Levels

Rainfall on Lakes Superior and Ontario in July brought some relief to low water level problems.

Both lakes remain below their levels recorded at the same time last year, but Lake Superior's level rose by 10 cm in July, and Lake Ontario's level remained stable rather than falling as it usually does this time of year.

Environment Canada's
Cornwall and Burlington
offices have been receiving
telephone calls through the
spring and summer from
people expressing concern
about low water levels on
both Lakes Superior and
Ontario.

"The rain that started in mid-July was a welcome relief," says Peter Yee of the Great Lakes-St. Lawrence Regulation Office in Cornwall

"But, we remind recreational boaters to watch the water levels closely."

Be aware that as water levels recede in the late summer and early fall, you may have problems accessing boat slips and docks." (More on next page)

Strange Rise And Fall Of Lake Levels

Thunder Storms Bring Mysterious Events

Shoreline observers from Goderich on Lake Huron and Corunna on the St. Clair River reported seeing water levels rise and fall by between one and two metres during the intense thunder storms that battered the Great Lakes on the evening of July 13.

Gauge records indicate that water levels rose and fell by up to 1.5 metres between 6 p.m. and 8:30 p.m. Actual fluctuations may have been larger but might not have been captured in preliminary gauge data, which contain readings at 15 minute intervals. Records from Gros Cap on Lake Superior show a drop in the local water level, followed by a rise between 3:15 and 5:15 p.m. on the same day. The total fluctuation was 88 cm. Around the same time at Sault Ste. Marie above the locks, the water level rose and fell by nearly 2 metres in all.

These events coincided with a band of compact, fast-moving thunder storms that ripped across the Great Lakes from the northwest to the southeast on July 13. The storms came ashore in Southern Ontario around 5:45 p.m. The Sarnia Weather Office reported that winds reached peak gusts of 47 knots between 5:50 and 6:30 p.m. The average wind speed was 30 knots.

Despite the high winds, it is unlikely that wind alone was the cause of the dramatic water level fluctuations. Surges -- or wind set-up -- usually require longer time periods to develop. It is more likely that the strange ups and downs of water levels on Lakes Superior, Lake Huron and the St. Clair River were caused by dramatic changes in barometric pressure that accompanied the thunder storms.

Middle Lakes Still Above Average

Lakes Michigan-Huron are at their long-term average level for the time of year. Lakes St. Clair and Erie remain between 15 and 20 cm above their averages. All of the lakes are below their levels of a year ago.

July rain boosted Lake
Ontario's water supply. This,
coupled with low outflows
prescribed by the lake's
regulation plan, helped levels
recover from a low of 20 cm
below average in May to a
near average level in August.

Montréal Harbour was below chart datum for four days in July, but by month's end it had risen to 25 cm above.

Flow Tests Deferred

Field tests aimed at improving fish habitat in the St. Marys River rapids have been postponed until 1996. Last month, we mentioned

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Editor, Ruth Edgett

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July Precipitation Over Great Lakes

As a percentage of the long-term July average:

Great Lakes Basin, 91% Lake Superior, 102% Lakes Michigan-Huron, 90% Lake Erie 66% (including Lake St. Clair) Lake Ontario, 95%

that the St. Marys River Remedial Action Plan (RAP) hoped to carry out the tests this summer with the cooperation of the International Lake Superior Board of Control.

Lake St. Lawrence Remains Higher

Water levels in the upper and lower St. Lawrence River continued below average in July. Meanwhile, the water level on Lake St. Lawrence, the artificial lake immediately upstream of the power dam at Cornwall, remained higher than average. This situation will likely continue well into August.

Assuming average water supplies for the next six months, Lake Superior's level is forecast to continue rising until September. Lakes Michigan-Huron, St. Clair and Erie are believed to have reached their seasonal peaks and are expected to begin their seasonal declines. A gradual decline in Lake Ontario's level is expected for the rest of this year.

Shore Buyers Guide Soon To Be Ready

The Information & Geomatics
Office of Environment
Canada and the

Conservation Authorities of Ontario have combined efforts to produce a *Buyers Guide to Lakeshore Property*, which will soon be available for purchase.

The 12-page, illustrated booklet gives prospective shoreline buyers hints for finding that ideal lakeshore location.

"Our experience over the years has been that many shoreline property owners make purchases without knowing that they are exposing themselves to risks," explains Ralph Moulton, Manager of the Information & Geomatics Office.

"This booklet attempts to give prospective buyers the basics to making informed decisions. It tells them how to find out if a property is in a hazard area and gives them pointers on warning signs that indicate whether a particular property is subject to flooding or erosion."

Contact your nearest
Conservation Authority or the
Information & Geomatics
Office (see box at left) for
information on how to obtain
a copy. Quantities will be
available to organizations on
a cost recovery basis.



CES-ST. LAWRENCE RIVER WATER LEVELS CA MT 160 -664

Volume 3, Number 9

September 8, 1995

Lake Levels Stay Nearly Constant

Wet first half of August and dry second half keep lake levels nearly constant

Heavy rainfall fell over much of the Great Lakes basin during the first half of August, while the last half of the month was generally hot and dry.

As a result, monthly average levels on all of the lakes stayed within two centimetres of the levels recorded in July.

With the onset of dry weather in the latter part of the month, the levels of Lakes Ontario and Erie began their seasonal decline, which was about one month later than usual

The delay in the start of the seasonal decline on Lake Ontario is good news for recreational boaters on · the lake and in the St. Lawrence River, as low water levels are a serious concern for that group. However, now that the decline has begun. boaters should exercise caution in shallow areas. (More on next page)

Information Sources on the World Wide Web

In the April edition of Level News we discussed Environment Canada's "Green Lane", our entry onto the Information Highway. If you have access to World Wide Web, the Great Lakes section is accessible through the Universal Resource Locator (URL) in our information box.

There are many other interesting locations with Great Lakes-related information. Daily water levels and precipitation data are available at: http://sparky.nce.usace.army.mil/hmpghh.html.

The Great Lakes Forecasting System at Ohio State University has forecasts of waves, levels and water temperature for Lake Erie. It also has wind, wave and water temperature data for the past twelve hours at a number of locations throughout the Great Lakes Basin. Its URL is: http://glfs.eng.ohio-state.edu/.

The Daily Planet, maintained by the University of Illinois at Urbana-Champaign, has a variety of weather forecasts and recorded data. There is so much information available that it can take awhile to find what you are interested in, but it can be worthwhile. Its URL is: http://www.atmos.uiuc.edu.

Marine forecasts can be accessed through both the Green Lane and the Daily Planet, but the most direct route is through: http://www.on.doe.ca/text/fpcn20.wto.

We will provide more sources in the future. If you have a favorite site that we have missed for Great Lakes levels or weather and climate-related information, send us an E-mail message with the URL.





The seasonal decline in water levels is expected to continue the rest of this year. Lake Superior, where levels remained constant during August, is expected to start declining in September.

August Precipitation Over the Great Lakes

As a percentage of the long-term August average:

Great Lakes Basin, 127%

Lake Erie, 87%

(including Lake St. Clair)

Lake Superior, 127% Lakes Michigan-Huron, 140%

NOTE: These figures are preliminary

Heavy Turnout At Public Meeting On Water Levels

About 155 people attended a public meeting on August 9 in Alexandria Bay, New York, organized by the International St. Lawrence River Board of Control

At the meeting, the Board presented its proposed scope of work to conduct a review of the criteria governing Lake Ontario

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regulation. A review of the regulation criteria was one of the recommendations in the IJC's 1993 Water Level Reference Study Report.

The Board heard comments from a rather diversified group. Recreational boaters in the Thousand Islands area of the upper St. Lawrence River preferred higher levels. Environmental interests welcomed a review, and demanded higher spring levels to improve fish habitats. On the other hand, residents from the Rochester, N.Y. area were concerned that the review would lead to a wider fluctuation of water levels on Lake Ontario, and increase flood and erosion damage.

Lake Ontario, 120%

The heavy turnout reflects the importance of water level fluctuations to various interests on the Lake Ontario - St. Lawrence River system. Those attending the meeting also heard presentations on how Lake Ontario regulation decisions are currently made, and on the status of two new regulation plans that are now being tested by the Board.

The Board will conduct three more public meetings this year, as listed below. For more information, please contact Ed Eryuzlu at 613-990-5617.

International St. Lawrence River Board of Control Public Meetings in September

The Board will conduct three more public meetings, as follows: September 18, Rochester, N.Y., (Holiday Inn at Airport) September 19, Kingston, Ontario (City Hall) September 20, Cornwall, Ontario (Civic Complex) All meetings will start at 7:00 p.m.

MT 160 -G64 news

Volume 3, Number 10

October 6, 1995

Dry September Throughout Great Lakes Basin

Lake Levels Decline Rapidly

After a relatively wet August, the weather turned dry again in September, resulting in a rapid decline in levels on most lakes. Levels on the middle and lower Great Lakes declined

by about 9 to 18 centimetres durina September.

While it is typical for the levels of these lakes to drop at this time of year, the decline was much larger than average. The combination of dry weather following a hot summer. which raised lake temperatures and (continued on next page)

750 Attend Four Public Meetings

Lake Ontario Regulation Remains a Hot Issue

About 750 people attended four public meetings held by the International Joint Commission's St. Lawrence River Board of Control.

About 500 attended the September 18 meeting in Rochester, NY. Some 90 presentations were made to the Board by riparians, boaters, environmentalists and elected officials. Virtually all presentations were in support of lower Lake Ontario water levels. The Rochester area suffered extensive flood damage during the 1993 high water level period.

At the September 19 meeting in Kingston and the August 9 meeting in Alexandria Bay, NY (discussed in the September Level News), recreational boaters and riparians along the upper St. Lawrence River voiced concerns over low water levels during late summer and early fall.

At the Cornwall meeting on September 20, presentations were made emphasizing the importance and benefits of water level fluctuations in the lower St. Lawrence River for wetlands habitat and ecosystem diversity and productivity. Concerns were expressed that the existing regulation plan does not take downstream environmental and other interests fully into consideration.

Views and information acquired at these meetings will assist the Board in developing and discussing with the IJC the scope of work required for a review of the Lake Ontario-St. Lawrence River regulation criteria. This review was recommended in the Lake Levels Reference Study report of 1993.

Answers to questions raised at the Public meetings will be printed in an upcoming issue of Level News.

evaporation rates, led to the rapid decline.

With the decline in levels, Lakes Huron and Ontario are slightly below average, while Lakes St. Clair and Erie are about 10 centimetres above their seasonal averages.

Lake Superior Level Rises Slightly

Lake Superior's level went up slightly during the past month. This is partly due to high tributary inflows brought on by higher rainfall in August and September. Also, the lake typically has a later start than the others to its seasonal decline in levels. Despite the increase, the lake is still about 13 centimetres below average level.

Low Levels Continue at Montreal

For the third month in a row, and fifth month of the past six, water levels in Montreal Harbour were the lowest since 1967. The combination of low outflows from Lake Ontario, low Ottawa River flows, and below average local inflows to the St. Lawrence River have adversely affected shipping at the Harbour.

The Harbour levels were below chart datum for several days during the month. To help prevent Harbour levels from falling below chart datum, the International St. Lawrence River Board of Control has released higher flows using four centimetres of extra water stored on Lake

September Precipitation Over Great Lakes

As a percentage of the long-term September average:

Great Lakes Basin, 79%

Lake Erie, 35%

(including Lake St. Clair)

Lakes Michigan-Huron, 69%

Lake Ontario, 63%

NOTE: These figures are preliminary

Ontario in late spring and early summer this year.

Risk of Flooding Reduced This Fall

With the levels of all the lakes lower than last year at this time, the risk of flooding is reduced. Lakes Huron, St. Clair and Erie are all more than 15 centimetres lower than one year ago.

The main threat of flooding in the fall months is during severe wind storms, which can create high seiches on Lake Erie. Despite lower lake levels, such storms could still cause problems, particularly near the eastern and western ends of the lake.

Niagara River Meeting With Public

Six persons attended the annual meeting with the public of the International Niagara River Board of Control on September 28 in Niagara-on-the-Lake. Niagara River Remedial Action Plan representatives were also present.

Last Edition for Six Month Subscribers

For those of you that requested to receive the Water Level Bulletin and Level News for the six months from Spring to Fall, this is the last edition you will receive this year. You will automatically start receiving them again in early May 1996.

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Volume 3, Number 11

Opal Hits Lower Basin

DEC 5 1995

HEAVY OCTOBER RAIN ON GREAT LAKES

After a relatively dry spring and summer over much of the area. the weather turned wet in October, bringing abundant water supplies to the Great Lakes system.

The effect of Hurricane Opal, and several other weather systems later in the month. slowed the decline in levels that typically occurs this time of year on all the lakes. Opal dropped up to 10 centimetres of rain on portions of Lake Ontario's basin. Lake Ontario's level moved from eight centimetres below average at the beginning of October to 11 centimetres above average by the end of the month

The October rain has also put an end, for the foreseeable future, to the very low water level crisis at

the Port of Montreal. Levels in the Port rose by over 50 centimetres from the beginning of October to the end of the month.

Lake Superior also saw its level rise, due to the third consecutive month of above average rainfall on its basin. Both Lakes Superior and Huron are presently very close to their seasonal averages. Lakes St. Clair and Erie are both currently about 12 centimetres above average.

While the impact on lake levels of the wet weather was evident, it was less than might have been anticipated for such a high amount of precipitation. This is probably due to the very dry conditions that existed over most of the basin at the beginning of October. A large portion of the rain was absorbed by the dry land

and by inland lakes and wetlands. with the result that runoff to the Great Lakes was less than otherwise would have occurred.

Lake Superior may see very little change in its level in November, whereas the other Great Lakes are expected to decline the rest of this year. The threat of serious flood damage remains low due to present and expected water level conditions over the next several months.

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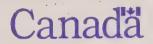
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October Precipitation Over Great Lakes

As a percentage of the long-term October average: Great Lakes Basin, 161% Lake Superior, 199% Lakes Michigan-Huron, 134%

Lake Erie, 132% (including Lake St. Clair) Lake Ontario, 214%

NOTE: These figures are preliminary



RESPONSES TO QUESTIONS AT PUBLIC MEETINGS

During five recent public meetings held by the International St. Lawrence River Board of Control, a number of questions were raised by the public on the subject of Lake Ontario outflow regulation. As part of Environment Canada's goal to enhance public understanding of the subject, we have included in this issue some of the key questions raised, along with the answers provided by the Board.

We will be following the Board's next public meeting, scheduled for November 7 in Montreal, and will keep our readers updated on the results of that meeting.

1. Why doesn't the Board implement Regulation Plan 35P for Lake Ontario, a recommendation that came out of the IJC's Levels Reference Study?

Lake Ontario regulation is governed by criteria in the IJC's 1952 Order of Approval and its 1956 Supplementary Order. Plan 1958-D, the plan presently in place, was designed with these criteria in mind. The Board is testing the performance of Plan 35P, and another new plan called IS4, for three years before making a recommendation to the IJC. The testing is being performed considering the existing IJC criteria.

2. Why would the Board consider Plans 35P and IS4, when they favour new interests and would cause higher Lake Ontario levels?

These plans do not favour new interests. The intent of the designers of these plans was to maintain or enhance benefits to the long recognized interests, while providing benefits where possible to the newer interests. These plans, when tested with historical water supplies, result in slightly higher average levels but reduce the frequency of extreme flood levels on Lake Ontario and downstream compared to existing regulation.

3. Is the Board violating the Boundary Waters Treaty of 1909 when it considers other interests in the regulation of Lake Ontario?

The Board does not agree that consideration of interests other than those specifically mentioned in the IJC's criteria for Lake Ontario regulation would violate the Treaty. Consideration of other interests may result in revisions to the IJC's existing regulation criteria or the existing regulation plan. None of these revisions would specify raising the natural level of water which is a restriction of the Treaty, the natural level being that which would exist without regulation.

4. Why do water levels drop rapidly overnight under ice conditions on Lake St. Louis?

Ice formation restricts the flows and causes flow patterns to change, cutting off water to certain parts of the river. Sometimes it is necessary to reduce flows at the hydropower plant in order to promote formation of a stable ice cover. When this occurs, water levels downstream of the plant will drop.

5. What caused low levels in the Montreal area of the St. Lawrence River this year?

The low level conditions on Lake St. Louis and at the Port of Montreal were mainly caused by low flows from the Ottawa River and other local tributaries, and somewhat less than average Lake Ontario outflows. These were the result of lower than average rainfall this year and a much lower than average spring snow melt.

6. Did the Board let too much water out of Lake Ontario in January and February this year?

Because of ice conditions in the St. Lawrence River, it is not always possible to release from Lake Ontario the exact amount specified by the regulation plan. Flows at times will be higher when ice conditions permit, to be followed by lower flows at a later time. Lake Ontario outflows in January this year were more than the amounts specified by the regulation plan. However, in early February when ice began to form in the river, flows were less than the amounts specified by the plan, offsetting the earlier deviations.

7. Why didn't the Board hold water back on Lake Ontario this spring to deal with low water levels later downstream on Lake St. Louis and at Montreal?

Early this year, the Board did retain some water on the lake. The stored water was used in September to help alleviate low level conditions in the Montreal area.

8. Can the dams in the Ottawa River be used to reduce flooding or raise low water levels in the Montreal area?

No, it is not possible, because the closest control dam does not have sufficient storage capacity to vary flows for the area. Most storage reservoirs in the Ottawa River system are located too far upstream from the Montreal area for this purpose.

9. Why do levels sometimes fall so rapidly in the St. Lawrence River upstream of Cornwall?

This is a result of high easterly winds causing a surge on Lake Ontario. Low levels at the eastern end of the lake result in low levels in the upper St. Lawrence River.

10. It appears that the Board has been regulating Lake Ontario levels to keep them in the upper half of the regulation range specified in the IJC's criteria. Why?

The fluctuation of Lake Ontario levels is largely dependent on the weather, with regulation having a limited control. Lake levels have been high because of high water supplies to the lake, and low supplies will cause low levels. Since Lake Ontario regulation began in 1960, water supplies to the lake have been higher than average due to generally higher than average precipitation on the Great Lakes basin. For this reason, the long-term mean levels since 1960 tend to be slightly higher than the average prior to 1960.

Lake Erie, which is not regulated and provides about 85% of Lake Ontario's supply, also experienced higher levels during the past 35 years than prior to 1960.

11. What have been the actual Lake Ontario levels, before and after regulation?

While many factors have affected lake level fluctuations in the post- and pre-regulation periods, comparison of the monthly mean data before and after 1960 shows the following: the long-term average during the period 1918-1959 on Lake Ontario was 74.70 m (IGLD 1985), with the monthly mean values ranging from a high of 75.76 m to a low of 73.74 m. In the post-regulation era (since 1960), the long-term mean value is 74.80 m, with a maximum monthly mean value of 75.73 and a minimum value of 73.83 m. The average seasonal range was 48 cm prior to regulation, and 55 cm since 1960.

The slightly higher long-term mean level in the post-regulation era is due to higher water supplies to Lake Ontario since 1960. The post regulation period supplies are about 10% more than those prior to 1960. Lake Erie also had the same pattern and that lake is unregulated.

12. Why does the Board propose to raise Lake Ontario levels to 248 feet (75.6 m) IGLD 1985, from April 1 to October 1, knowing this would cause flood damage on the lake?

There has been no Board proposal to raise the lake to this level. This was one of many requests made to the Board during the public consultation process, some calling for higher levels and others calling for lower levels.

13. If the Board did not intend to raise the lake level, why was the revetment at the United States Coast Guard Station at Rochester, New York, built so high?

The need for the structure came about as a result of a 1992 storm surge event. At that time, the waters of Lake Ontario were driven ashore by hurricane force northeasterly winds. The station itself sustained flood damage and the accompanying wave action nearly destroyed an existing boathouse. The revetment is designed to protect against future storm surge events similar to the one that occurred in 1992. It was not designed in anticipation of any managed increase in the water surface elevation of Lake Ontario.

14. Why can't the Board keep Lake Ontario levels lower in the fall to make room for spring runoff?

The natural seasonal water supply cycle to Lake Ontario typically causes higher levels in June or July, followed by declining levels until December or January. Regulation preserves this cycle and also makes room on the lake for spring runoff.

Unless there is a great risk of very high levels in the spring, Lake Ontario should not be drawn down by any more than under normal conditions. If the winter turns dry, excessive lowering of the lake will lead to low levels the following spring.

15. Why can't the Board regulate Lake Ontario to near long-term average?

Regulation Plan 1958-D was designed to regulate Lake Ontario's levels and outflows to meet criteria established by the IJC. These criteria aim to provide benefits to the interests, or to provide them protection from extreme high or low levels and flows. Maintenance of long-term mean levels for Lake Ontario at all times is not the objective of regulation, nor would it be achievable without wide fluctuations in flows of the St. Lawrence River. Such flows would be detrimental to many interests, including hydropower, seaway navigation, recreational boating in the river and riparians downstream.

16. Why don't we regulate Lake Erie so that we can have tighter control for Lake Ontario?

There are no facilities to control Lake Erie's outflows. Recent IJC studies have recommended against Lake Erie regulation on the basis of costs and adverse environmental impacts.

If Lake Erie were regulated, it would not likely result in "tighter control" of Lake Ontario, since interests on Lake Erie would want to vary outflows to meet their needs, resulting in the potential for a larger variation in Lake

Ontario levels.

17. Why don't we alter Long Lac/Ogoki and Chicago diversions to better manage Lake Ontario levels? Because of their distant location relative to Lake Ontario, it is impossible to vary these diversions to provide a timely response to the ever changing water supplies to Lake Ontario. Secondly, variations in these diversions only result in very small changes in the total water supplies to Lake Ontario. Lastly, altering these diversions will have significant adverse impacts on their respective local systems.

18. The IJC's Criterion (j) sets a minimum Lake Ontario level for April 1. Why is there no criterion for a maximum on April 1?

The reason for Criterion (j) is to ensure adequate levels on Lake Ontario for the start of the navigation season. Although no maximum was set, the need to avoid monthly mean levels above the Criterion (h) level of 75.37 metres IGLD 1985 on Lake Ontario at any time reduces the potential for high levels on April 1.

19. What is the definition of low levels in the IJC's Orders of Approval and regulation criteria?

Low levels are usually considered those that would adversely impact intakes for water supply and commercial navigation on Lake Ontario and the St. Lawrence River. There are presently no low levels provisions related to recreational boating in the IJC's Orders of Approval or regulation criteria.

20. Did adoption of the new International Great Lakes Datum of 1985 raise Lake Ontario levels six inches?

The new datum did not raise lake levels, it simply assigned a more accurate and up-to-date measurement of the shoreline and lake level elevations relative to sea level. The datum change did not raise the level of the lakes relative to the shoreline. The new elevation values assigned within the new datum were also assigned to the figures in the regulation criteria and regulation plan.

21. The Board kept Lake Ontario levels too high in the fall of 1992; the result was extensive flood damage in 1993. Why didn't the Board react sooner?

In September and October of 1992, the Board reduced Lake Ontario outflows to facilitate repairs at the Moses-Saunders hydropower plants at Cornwall, Ontario and Massena, New York, and at the Beauharnois-Cedars hydro complex near Montreal. Secondly, these actions also helped recreational boaters in the Lake Ontario-Thousand Island area as the boating season had not

ended. The water retained on Lake Ontario from this action resulted in a 10 cm rise on Lake Ontario. However, this water was completely released from Lake Ontario by the end of the year through higher outflows.

The very high water level conditions on Lake Ontario in 1993 were caused by a combination of several factors. Lake Ontario in January 1993 received record high water supplies for the month, while in April the lake received an all-time high record water supply. Severe ice conditions in the St. Lawrence River also reduced its flow capacity for much of the winter. In spite of the difficulties, the Board was able to release flows from Lake Ontario in the winter and spring that were much higher than specified by the regulation plan, resulting in Lake Ontario levels being 24 cm lower than under the plan, and 36 cm lower than would have occurred without regulation.

22. Would lower Lake Ontario levels help with beach replenishment?

The recently completed Levels Reference Study examined the relationship between lake levels, shore protection, shoreline types, and coastal processes. For some of the Lake Ontario shoreline, there is little impact of changing water levels on long-term erosion rates. In the case of beach replenishment, if the source of the beach's sand is interrupted, then lower lake levels will have no impacts. Also, if the shoreline being eroded has clay, the material will not be replaced at any water level.

23. How does a wider range of lake levels help wetlands?

A range of water levels is necessary for a healthy, sustainable wetland. Periodic flooding and drying of wetlands ensures a succession of a variety of vegetation types, providing a diversity of wildlife habitat.

24. Would improved long-term weather forecasts help in management of levels and flows?

Climate experts around the world are working hard on this subject and the Board would welcome any technologies that would aid in managing levels and flows in the system.

25. How does the Board make its decisions?

The Board constantly assesses the hydrologic conditions in the Great Lakes-St. Lawrence River system. The Lake Ontario outflows are usually as specified by the regulation plan, but the Board also has discretionary authority to direct higher or lower flows. Decisions to deviate from the regulation plan are made only after careful assessment of conditions throughout the system, and taking into consideration the needs of all users and interests.



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Volume 3, Number 12

December 6, 1995

Heavy Precipitation in November

Seasonal Decline in Levels Stopped

The second consecutive month of above average precipitation on the middle and lower portions of the Great Lakes Basin held lake levels almost constant at a time of year when they usually decline.

At the start of December, Lake St. Clair was 23 cm above average for the time of year, while Erie and Ontario were 16 and 19 cm, respectively, above average.

Lake Ontario's situation has seen a dramatic change since its levels were as much as 22 cm below average in May of this year. Abundant water supplies first brought in by Hurricane Opal in early October and then by other weather systems that followed has stopped the seasonal decline of its level. The lake's outflow has also increased to 8120 m³/s by early December, about 23% more than average.

Lake Superior declined to about 4 cm below average, while Lakes Michigan-Huron stayed at 4 cm above average in early December.

Great Lakes water levels are expected to remain well within the historical range for the coming winter and as such, the threat of serious flood damage remains low. Much higher than (continued on next page)

Ten Years Ago Severe Storm Hit Lake Erie

Ten years ago a storm that caused major destruction around Lake Erie roared through the area. In the early morning hours of December 2, 1985, southwest winds gusting to 100 kilometres per hour pushed the water level at Fort Erie up by about 2.4 metres, to the highest level on record. The accompanying waves pounded the shoreline, eroding beaches and damaging kilometres of shore protection. Over thirty cottages were destroyed at Long Point alone, and many others were damaged or destroyed along the eastern end of the lake by waves and flooding. Emergency crews assisted in the evacuation of residents trapped in low-lying homes.

The American side of Lake Erie also took a severe pounding, as did the southeastern shores of Lakes St. Clair and Huron. While property damages from the storm were extensive, fortunately there were no deaths reported. Advance warning of the impending storm helped prevent the loss of any ships and alerted emergency crews.

average outflows from Lake Ontario are anticipated in the coming weeks, which will reduce the risk of flooding on that lake next spring.

Cold Temperatures Arrive Early

Several cold weather fronts entered the lower Great Lakes and the St. Lawrence River area in November. This was earlier than normal and if conditions remain the same, an early freeze up will occur on the St. Lawrence River.

E-mail List for Hydrologic Data

The International St Lawrence River Board of Control has created the Lake Ontario - St Lawrence River hydrology list (stlaw-l@cciw.ca). Stlaw-l is a free, unmoderated mailing list created to serve as a means of distributing weekly hydrologic information relating to Lake Ontario regulation to anyone interested.

To subscribe to stlaw-l send email to majordomo@cciw.ca. The letter body should contain these commands:

subscribe stlaw-l

The "subject" field of the message should be left blank.

Further information on operation of the list will be sent to you upon subscription.

November Precipitation Over Great Lakes

As a percentage of the long-term November average:
Great Lakes Basin, 144%
Lake Superior, 96%
Lake Superior, 96%
Lake Michigan-Huron, 164%
Lake Ontario, 166%

NOTE: These figures are preliminary

St. Lawrence Board Meets Public in Montreal Environmental Issues A Concern

The November 7th public consultation meeting in Montreal convened by the International St. Lawrence River Board of Control and the International Joint Commission attracted about 65 people. Concerns about the environmental effects of Lake Ontario-St. Lawrence River water level and flow regulation dominated the discussions. Presentations by the Assistant Deputy Minister of the Quebec Ministry of Environment and Wildlife and others emphasized the important link between fluctuating water levels and flows and environmentally sensitive wetland and aquatic habitat areas of the St. Lawrence River. Presentations were also made to the Board on the economic importance of commercial shipping in the St. Lawrence River.

This was the last of six public consultation meetings that the St. Lawrence Board held this year about possible changes to the Commission's criteria for the regulation of Lake Ontario outflows. The Commission has asked the Board to develop an outline of how to identify and assess possible changes to the criteria that might be needed to address changing conditions and

interests. Modifications to regulation that will respond to the needs of shoreline property owners, recreational boating and environmental concerns are being called for by public interest groups.

The Board plans to submit the description of work required to examine regulation criteria changes to the International Joint Commission by early January 1996. The Commission will then consider whether and how to proceed with this work.

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JAN 1995 THE WS

Volume 4, Number 1

January 8, 1996

SHIPS FACED DIFFICULTIES WITH ICE AS SEAWAY CLOSED

Ships on the St. Lawrence River and Welland Canal had to overcome serious ice problems during the last two weeks of the navigation season.

Cold air temperatures since mid-November caused ice formation to begin in early December in parts of the lower Great Lakes and St. Lawrence River. By mid-December, much of the St. Lawrence between Cornwall and Montreal was ice-covered.

In comparison, the winter of 1994-95 was very mild with little ice on the Great Lakes, and ice did not appear in the St. Lawrence River until early January.

Until December 25, when the last ship cleared the Welland Canal, ships on Lake Erie had to struggle through heavy ice fields when entering the canal locks. In the St. Lawrence River, ship traffic was restricted to daytime only and was assisted by ice breakers.

In fact, the ice problem was so serious that Seaway officials were concerned that destruction of the fragile ice cover in the Beauharnois Canal (just upstream of Montreal and serving both navigation and hydropower plants) could completely shut down the seaway.

The weather turned milder in late December, and the last ship cleared the Beauharnois Canal on December 26.

Ice Boom Installed

Installation of the Lake Erie-Niagara River ice boom was completed on December 16. The boom, located at the outlet of Lake Erie to the Niagara River, is installed each winter to strengthen the ice arch that naturally forms at this location.

This minimizes the occurrence and severity of ice jams in the Niagara River, which restrict river flow and cause damage to shoreline property.

Prior to use of the boom, heavy ice runs into the Niagara River caused frequent ice jams, resulting in serious damage to shore

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structures, flooding, and reductions in the generation of hydro-electric power at Niagara.

Levels Near Low Point

Water levels on the lower Great Lakes are expected to begin their annual seasonal rise with the start of the new year. However, no extreme high or low water level conditions are expected for the next several months. During December, Lake Superior and Lakes Michigan-Huron were very close to average levels, while Lakes St. Clair, Erie and Ontario were about 10 cm above average.

December Precipitation Over Great Lakes

As a percentage of the long-term December average:

Great Lakes Basin, 88%

Lake Erie, 64%

Lake Superior, 109%

(including Lake St. Clair)

Lakes Michigan-Huron, 92% Lake Ontario, 71%

NOTE: These figures are preliminary

THE POPUL

Le 8 janvier 1996

Volume 4, Numéro 1

LA VOIE NAVIGABLE FERMÉE EN RAISON DES GLACES

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aux structures riveraines, des inondations, et une baisse de la production hydro-électrique.

Faibles niveaux d'eau

Les niveaux d'eau des Grands Lacs connaîtront leur hausse saisonnière au début de la nouvelle année. Cependant, on ne s'attend pas à des hausses ou à des baisses extrêmes au cours des prochains mois. Durant le mois de décembre, les lacs Supérieur et Michigan-Huron ont été très près de leur moyenne, tandis que les lacs Sainte-Claire, tandis que les lacs Sainte-Claire, tândis que les lacs Sainte-Claire, tândis que les lacs Sainte-Claire, tândis que les lacs Sainte-Claire, privêt de la Ontario dépassaient leur niveau moyen d'environ 10 cm.

craignaient que la mince couche de glace recouvrant le canal Beauhamois (situé directement en amont de Montréal, et utilisé à la fois par les navigateurs et les centrales hydroélectriques) ne paralyse complètement la voie maritime.

Le temps doux est revenu vers la fin décembre, et le dernier navire quittait le canal Beauharnois le 26 décembre.

Digue contre les glaces

Le 16 décembre dernier était terminée l'installation d'une digue contre les glaces à la décharge du lac Érié, dans la rivière Niagara. Cette digue est installée chaque hiver pour renforcer la crête de glace qui se forme naturellement à cet endroit.

La digue permet de réduire le nombre et la gravité des embâcles sur la rivière Niagara, embâcles qui obstruent la rivière et causent des dommages aux propriétés riveraines.

Avant qu'une digue ne soit installée, les fréquentes descentes de glace dans la rivière Niagara provoquaient souvent des embâcles, qui entraînaient des dommages sérieux

Les deux dernières semaines n'ont pas été de tout repos pour les équipages qui naviguent sur le fleuve Saint-Laurent et le canal Welland, car la glace y a créé de sérieux problèmes.

L'air froid qui souffle sur la région depuis la mi-novembre a entraîné la formation de glace sur une bonne partie des Grands Lacs inférieurs et du fleuve Saint-Laurent. À la midécembre, presque toute la surface du fleuve située entre Cornwall et Montréal était la proie des glaces.

En revanche, l'hiver de 1994-1995 a été très clément et il s'est formé très peu de glace sur les Grands Lacs et le fleuve Gaint-Laurent avant le début janvier.

C'est le 25 décembre que le dernier navire a franchi le canal Welland, et jusqu'à cette date, les navires qui passaient par le lac Érié devaient se frayer un chemin à travers d'épais champs de glace avant d'atteindre les écluses. La navigation de nuit a été interdite sur le fleuve été interdite sur le fleuve d'avoir recours à des brise-glaces.

En fait, le problème était tel que les

dirigeants de la voie maritime

Grands Lacs - Précipitations en décembre

Pourcentage de la moyenne à long terme pour décembre Bassin des Grands Lacs, 88% Lac Érié, 64% Lac Supérieur, 109% (y compris le lac Sainte-Claire)

Lac Ontario, 71%

Lac Supérieur, 109% Lacs Michigan et Huron, 92%

Canada





Great Lakes Levels Reach Season's Low Point

It is likely that Great Lakes water levels reached their season's lowest points in January, except Lake Superior where the level is expected to continue to decline until March.

A mid-January thaw with three days of very mild temperatures and rain melted much of the snow on the Lake Ontario basin. The lake's level rose rapidly in the second half of the month, and by month's end stood at about 17 cm higher than the

seasonal average. Lakes Erie and Michigan-Huron were about 10 cm above average whereas Lake Superior was near average.

Ice in the St. Clair River in early January reduced flows out of Lake Huron, causing a large grain of require some short-term drop in the level on Lake St. Clair. Following the mid-January thaw, Lake St. Clair's level has rebounded to about 20 cm above average.

Extremely cold temperatures returned at the beginning of February, and more ice is expected to be generated on the Great Lakes, the connecting FEB 14 19hannels, and the St. Lawrence River. Changing ice conditions in the St. Lawrence River may adjustments to the Lake Ontario outflows. To-date, ice in the St. Marys and St. Lawrence Rivers has not posed any difficulties in regulation of the outflows of Lakes Superior and Ontario.

1995 - Hot and Cold, Wet and Dry

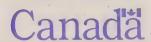
1995 was a year of unusual weather variability in the Great Lakes Basin. Extremely hot weather was experienced in the summer, followed by a cold November and December. The first half of the year was drier than normal, with some extended periods of very dry weather, while the fall was very wet.

During the year, precipitation over the basins of Lakes Superior, Michigan and Huron was above average, while it was below average over Lake Erie's basin and average over Lake Ontario. Overall, precipitation was five percent above average over the Great Lakes basin.

Hot summer weather causes higher evaporation from the land and higher water usage by vegetation, while cold weather in the fall also accelerates evaporation. (You may recall seeing vapour rising from a lake on a cold autumn morning, and residents of many areas are very familiar with the expression "lake effect snow".)

Water levels on Lakes Michigan, Huron and Erie were 16 centimetres lower at the end of 1995 than at the year's start, while Lake Ontario's year-end level was 14 centimetres higher than in January 1995. Lake Superior's level was essentially the same at the start and end of the year. All of the lakes ended the year with their levels within 10 centimetres of average.





More WWW Sites

For those of you that have access to the World Wide Web, here are the Universal Resource Locators (URLs) of two sites that may be of interest.

The first site is operated by the U.S. National Weather Service, and contains charts of ice conditions over the Great Lakes. The charts are updated every other day, based on observations from a number of sources. The URL for this site is: ftp://140.90.54.61/pub/ GreatLakes/NWS/. Files beginning with the letter "e" refer to the eastern part of the basin, while files beginning with "w" refer to the western portion.

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January Precipitation Over Great Lakes

As a percentage of the long-term January average: Great Lakes Basin, 143% Lake Superior, 206% Lakes Michigan-Huron, 128%

Lake Erie, 105% (including Lake St. Clair) Lake Ontario, 126%

NOTE: These figures are preliminary

The second site contains maps of U.S. weather radar images. The images show intensity and state (i.e. rain or snow) of precipitation, as well as the amount of precipitation over the past 24 hours. The radar sites are all in the United States, but their images extend into Canada. The URL for this site is: http://asp1.sbs.ohiostate.edu/nexrad.html

Niagara Board

The International Niagara Board of Control will hold an Open House on Tuesday, March 19, 1996 beginning at 7:00 p.m. at the Buffalo Hilton, 120 Church Street, Buffalo N.Y.

The purpose of this open house is to inform the public of the Board's current activities and to hear public comments and suggestions regarding the Board's work. In addition, information will be presented on a 1996-97 field demonstration of an improved design for the Lake Erie-Niagara River Ice Boom.

Representatives of the Niagara River Remedial Action Plans will also be invited to attend. These Remedial Action Plans identify environmental conditions and problems as well as specific measures necessary to improve water quality and restore beneficial uses of the river.

For more information contact Len Falkiner at (905) 336-4947.

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T LAKES-ST. LAWRENCE RIVER WATER LEVELS



Volume 4, Number 3

March 7, 1996

Seasonal Rise in Levels Underway

Spring Flood Risk Low On Great Lakes

Water levels on the middle and lower Great Lakes are expected to rise in March, as is typical for this time of the year, but the risk of serious spring flooding remains low.

After a rapid rise during the mid-January thaw, Lake Ontario's level held almost steady in February and was

about 19 cm above average at the end of the month. Lakes Michigan-Huron and Erie were generally 10 cm above average, and all were lower than the levels one year ago.

During March a small decline in the levels is expected on Lake Superior, which ended February 5 cm above average. Water levels at the Port of Montreal remained well above chart datum due to increased flows from the Ottawa River and Lake Ontario. The harbour level is expected to remain well above chart datum in March.



Great Lakes Atlas Published

The third edition of The Great Lakes Environmental Atlas and Resource Book is now available for purchase. This 46 page colour atlas contains a wealth of information on the Great Lakes, their environment, and human activities within their basin. Much of the material from earlier editions has been updated to reflect current knowledge and emerging issues. There are chapters on natural processes, people and their activities, current concerns, joint management of the Great Lakes, and new directions for the Great Lakes community. Specific topics range from agriculture to zebra mussels. A combination of maps, diagrams, photos, tables and text is used to convey information in a very reader-friendly fashion.

The atlas is a joint product of the Government of Canada and the United States Environmental Protection Agency. It is available in English and French, for \$19.95 per copy plus GST and shipping and handling of \$3.50 for one to three copies, from our Burlington location listed in the "For More Information" box on the next page. Bulk prices are also available. If you wish to purchase a copy, please mail a cheque or money order payable to "The Receiver General for Canada" and specify the language desired. The atlas will also soon be accessible through the GLIMR homepage on the World Wide Web.

St. Lawrence River Bulletin

In addition to preparing the forecast of water levels of the Great Lakes and Montreal Harbour used in the accompanying bulletin, Environment Canada also prepares water level forecasts for the upper St. Lawrence River. The forecasts are issued monthly during the boating season and cover six river sites from Kingston, Ontario to Pointe Claire, Ouebec. If you wish to subscribe to this bulletin (for a fee of \$10 per year), please contact our Cornwall office listed below.

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February Precipitation Over Great Lakes As a percentage of the long-term February average:

Great Lakes Basin, 115% Lake Superior, 160% Lakes Michigan-Huron, 118% Lake Erie, 76% (including Lake St. Clair) Lake Ontario, 78%

NOTE: These figures are preliminary

Ice Breakup Begins

Ice cover on the middle and lower Great Lakes has started to dissipate. By the end of February much of the northern and central parts of Lake Huron and northern Georgian Bay had open water. This was also the case at the western end of Lake Erie and in Long Point Bay. Earlier this winter Lake Erie and Georgian Bay were completely ice covered, as was most of Lake Huron.

In Lake Ontario, ice was confined to the extreme eastern end and the Bay of Quinte by the end of February. At its peak, ice covered about one-quarter of the lake.

By contrast, Lake Superior was almost totally ice covered at the end of the month. Open water was confined to a small patch west of Michipicoten Island.

Open House

As mentioned last month, the International Niagara Board of Control will hold an Open House on Tuesday, March 19, 1996 beginning at 7:00 p.m. at the Buffalo Hilton, 120 Church Street, Buffalo N.Y.

The purpose of this open house is to inform the public of the Board's current activities and to hear public comments and suggestions regarding the Board's work. In addition, information will be presented on a 1996-97 field demonstration of an improved design for the Lake Erie-Niagara River Ice Boom.

For more information contact Len Falkiner at (905) 336-4947.



Volume 4, Number 4

April 4, 1996

APR 12 1596

Dry Weather Over Most of the Basin Seasonal Rise in Lake Levels Stalled

After a wetter than average start to the year in the upper portion of the Great Lakes basin, dry conditions throughout the basin during March put the brakes on the seasonal rise in lake levels and flows. Only Lake Erie experienced a significant increase in levels during the month, with all the other lakes and the Port of Montreal either holding steady or declining slightly.

The water level at the Port of Montreal has been declining gradually since late February, and is expected to rise again during the Ottawa River freshet, sometime in April or early May.

Water levels on Lakes Ontario, Erie and St. Clair are expected to begin rising gradually until June or July. Lake Ontario is currently near the seasonal average whereas Erie and St. Clair are 10-20 cm above average.

Both Lake Superior and Lake Michigan-Huron levels are slightly above the seasonal average and are expected to rise until August or September.

After an early freeze-up last winter in the St. Lawrence River between Lake Ontario and Montreal, ice was just about gone by the third week of March. However, ice cover persisted over much of the Great Lakes, with the exception of Lake Ontario, at the end of March.

The 1996 Seaway navigation season began on March 29 in both the St. Lawrence River and the Welland Canal.

Changes Proposed for Ice Boom

The central topic of discussion at the International Niagara Board of Control's meeting with the public in Buffalo on March 19 was a proposal by Ontario Hydro and New York Power Authority to use steel pontoons in the Lake Erie-Niagara River ice boom. The power entities have requested permission from the International Joint Commission to conduct a field demonstration in 1996-97 by replacing five of the twenty-two timber spans with steel pontoons, as a cost saving measure. If this is successful and receives IJC approval, the remaining timber spans would be replaced over the following three years. No concerns or objections to the proposal were raised at the meeting.

Getting The Most From Your Water Level Bulletin

The Water Level Bulletin that you receive every month along with this newsletter contains historic as well as forecast information about the levels of the Great Lakes and Montréal Harbour.

1. The six graphs show the sixmonth water level forecast together with levels actually recorded since January, 1995.

The recorded levels are indicated by the curving black line that extends part way across the grid. The two dotted lines that diverge from the end of this line indicate the six-month forecast. They allow for very high water supplies (the top line) and very low water supplies (the bottom line). Depending upon supplies that actually occur, the water level is forecast to fall between

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March Precipitation Over Great Lakes As a percentage of the long-term March average:

Great Lakes Basin, 67%
Lake Superior, 75%
Lakes Michigan-Huron, 59%

Lake Erie, 79% (including Lake St. Clair) Lake Ontario, 67%

NOTE: These figures are preliminary

these two lines, although extremely high or low supplies could cause levels above or below these lines.

2. You can compare recently recorded levels and the forecast with the long-term averages for each of the lakes or Montréal Harbour. The long-term averages are indicated by the undulating gray lines that extend the entire width of each graph.

These averages are taken over the period 1918 - 1995 for the lakes, and 1967-1995 for Montréal Harbour.

- 3. Each graph also indicates the highest and lowest water levels recorded during the period of record. These are represented by bars corresponding to each month of the year, and are accompanied by the year in which the particular level was recorded.
- 4. For example, the maximum water level for Lake Erie in May was recorded in 1986. The record low occurred in 1934.

The figures along the right hand side of the graph tell you that the record high water level elevation was slightly less than 175 metres (IGLD 1985).

IGLD is short for International Great Lakes Datum, which is the reference system used for measuring Great Lakes-St. Lawrence levels. Elevations are measured in metres above a zero point in the St. Lawrence River that corresponds roughly to sea level. 175 metres on the graph can be interpreted as 175 metres above sea level. Each block on the graph represents 10 centimetres (20 cm at Montréal).

5. Using the figures on the left hand side of the graph, you will find that the May record high for Lake Erie was about 1.5 metres above Chart Datum. The May record low was about 8 cm below Chart Datum.

Chart Datum is a reference level used for depths shown on navigation charts. For example, Chart Datum for Lake Erie is 173.5 metres above sea level.

6. The back page of the Bulletin summarizes some of these statistics.

Boards of Control Public Meetings

The International St. Lawrence River Board of Control will hold its annual meeting with the public in Watertown, New York on either June 4 or 5. The Lake Superior Board of Control is also planning to hold its public meeting sometime in mid-June or early July, in the Whitefish Bay area of Michigan. These dates are tentative, and we will update you in our next issue.



SEP 30 1996

Volume 4, Number 5

Lakes Near Average Levels

Late April Rains Raise Water Levels

After a dry March and early April, abundant rainfall returned to the Great Lakes basin in the latter part of the month.

The April rain coincided with the Ottawa River spring freshet, which significantly increased inflow into the St. Lawrence River near Montreal. As a result, Lake St. Louis' level rose to near flood stage. Until the rain arrived, there had been concern that a repeat of last year's very low water levels on Lake St. Louis would seriously affect fish spawning and area wetlands.

The St. Lawrence River water level at the Port of Montreal rose to more than two metres above chart datum at the end of April. The harbour level is expected to decline gradually over the next few weeks but remain well above chart datum.

Lake Ontario's level rose from below average in early April, to near average by month's end. A further moderate rise in level is expected until June or July, depending on rainfall over that period.

Lake St. Clair's level dropped drastically due to an ice jam in the St. Clair River, which reduced flow from Lake Huron (see article on next page). Extensive ice breaking efforts cleared the jam late in the month and the lake's level recovered to slightly above average by early May.

Lake Erie's level was also depressed by the ice jam, but the impact was much less than on

Lake St. Clair. By the end of April, heavy rainfall had pushed up Lake Erie's level to several centimetres above the seasonal average. Lake Erie's level is expected to peak in about July.

Lakes Huron and Superior are both currently slightly above average. Their levels began to rise during the last half of the month, and they are expected to continue to rise gradually until August or September.

With levels on all the Great Lakes very close to average, the risk of serious flooding around the lakes remains low.

April Precipitation Over Great Lakes

As a percentage of the long-term April average:

Great Lakes Basin, 145% Lake Superior, 140% Lakes Michigan-Huron, 141% Lake Erie, 157% (including Lake St. Clair) Lake Ontario, 153%

NOTE: These figures are preliminary

Repairs at St. Marys River Control Structure Begin

From mid-May until October, workers will carry out repair and maintenance work on the compensating works located at the head of the St. Marys Rapids at Sault Ste. Marie, Ontario.

The 16-gated control structure was built between 1902 and 1919. Since 1921, when the last dyke closure was complete, the control structure has been used to regulate the outflows of Lake Superior under the direction of the International Joint Commission.

The flow out of Lake Superior passes through either the control structure or the hydropower plants located at the Rapids. Each month adjustments are made to the gate settings and/or flows through the hydropower plants such that the total flow

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equals the amount specified by the IJC's regulation plan.

Unlike newer designs where shelter forms a part of a structure, the St. Marys River control structure is exposed to the harsh winters and repeated ice action. Following engineering testing and structural reinforcing in the mid-1980's, the structure was found to be in good shape, but repairs are necessary to maintain it in good working condition.

Repairs are the responsibility of the dam's owners. The Canadian portion of the structure is owned by Great Lakes Power Company Limited while U.S. Army Corps of Engineers owns the other half.

Work this year will include dewatering some gates to facilitate concrete and masonry work in areas that are normally under water, replacement of gate sills and seals, repairs to mechanical parts that operate the gates, deck replacement and general cleaning and painting.

Workers will use barges to serve as work platforms and to transport equipment. To avoid high water velocities at the site, most of the gates will be opened slightly and each will discharge a small amount of flow. Usually, a limited number of gates are either one-half or fully open, and most of the gates are fully closed.

St. Clair River Ice Jam Reduces Flows

During much of April an ice jam blocked part of the St. Clair River and greatly reduced the river's flow. While the impact on Lake Huron's level was very small, it caused a large, temporary decline in Lake St. Clair's level and a small depression of Lake Erie's level.

For several days the level of Lake St. Clair was as much as 50 centimetres lower than it would otherwise have been. Once the jam dissipated, the lake's level went back up 50 centimetres over a five day period.

While most of the ice jam's effects on lake levels quickly dissappeared, it did cause the lowest April levels on Lakes St. Clair and Erie in three decades.

Ice Boom Removed

Removal of the Lake Erie-Niagara River ice boom began on April 17 and was completed on May 3. The boom is installed each winter to enhance formation of a stable ice cover, which has reduced formation of ice jams in the river.

Control Boards Plan Public Meetings

The International St. Lawrence River Board of Control is holding its annual public meeting on June 3 at 7:00 p.m. at the Best Western Carriage House Inn, 300 Washington Street, Watertown, NY. Topics to be discussed will include progress on the study to improve Lake Ontario regulation.

The International Lake Superior Board of Control will hold its public meeting on June 18 at 7:00 p.m. in the Paradise Community Centre, Paradise MI. The community is located along the shore of Whitefish Bay.



Volume 4, Number 6

June 7, 1996

Lake Ontario's Level Approaches Seasonal Peak

Lake Levels Rise Sharply

The late snowmelt in the northern portions of the basin, combined with heavy precipitation in mid May, led to an abrupt rise in lake levels in the last half of the month. As a result, the

levels of all of the Great Lakes rose by more than they usually do in May. Drier conditions late in the month halted the rise on most of the lakes, at least temporarily. At the end of May, Lake St. Clair was about 26 centimetres above average, while the other lakes were 10 to 20 centimetres above average.

(continued on next page)

Weatheradio and Weathercopy: For Weather Forecasts and Warnings

Are weather forecasts and weather warnings important to you? If they are, you can receive them within minutes of being issued through either Weatheradio or Weathercopy.

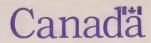
Through a series of VHF FM transmitters that blanket almost all of the Canadian Great Lakes - St. Lawrence shoreline, Environment Canada continuously transmits public weather forecasts, marine forecasts, and weather warnings to the Weatheradio network. Weatheradio receivers can be obtained through your local electronics dealer. It is possible to obtain receivers with an alarm signal that is triggered whenever a warning is issued.

Weathercopy is an advanced version of Weatheradio. The Weathercopy receiver incorporates a Weatheradio audio receiver, and is also able to receive these messages in digital format. The Weathercopy receiver can be connected to either a printer or personal computer, allowing messages to be printed or displayed on the PC's monitor. It also incorporates an alarm signal for warnings, as well as a flashing light signal for new forecasts.

At present, Weathercopy broadcasts can be received along the Canadian shores of most of the St. Lawrence River, Lake Ontario, Lake Erie, Lake St. Clair, southern Lake Huron, the St. Marys River, and near Thunder Bay. Weathercopy receivers are sold by Dataradio Inc., which can be contacted at 1-800-361-DATA.

If you have access to the Worldwide Web, further information is available at: http://www.on.doe.ca/awps/index.html

If timely weather forecasts and warnings are important to you, these services can ensure that you get the information when you need it.



In an effort to help prevent flooding on Lake St. Louis during the Ottawa River freshet, the International St. Lawrence River Board of Control reduced the Lake Ontario outflows from late April until mid-May. At the same time, the Board maintained the flow sufficiently high in order to provide adequate water levels for fish spawning on Lake St. Louis and downstream.

It appears that Lake Ontario is very close to its peak level for the year, and it will soon begin a gradual decline. Lake Erie is expected to reach its peak level during June, while levels on the other lakes will likely to continue to rise throughout the month. If, however, heavy rainfall should persist through June, then the levels of all the lakes will continue to rise.

Despite the abnormally large increase in lake levels during the past month, the risk of flooding remains low throughout the summer.

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Aussi disponible en français

May Precipitation Over Great Lakes

As a percentage of the long-term May average: Lake Erie, 109% Great Lakes Basin, 87%. (including Lake St. Clair) Lake Superior, 64% Lake Ontario, 108% Lakes Michigan-Huron, 86%

NOTE: These figures are preliminary

Accessing Water Level Data by Telephone

Present water levels on the Great Lakes and St. Lawrence River are available from a network of gauging stations operated by the Canadian Hydrographic Service. Phone numbers for the stations are listed below. When you call a particular station, the answering equipment will ask you to press 1 for English or 2 for French, on the keypad of your touch-tone phone. If you do not have a touch-tone phone, the message will start after a few seconds delay. The present water level is given in metres relative to chart datum at that station. Next the message gives the high and low water levels recorded during the previous 12 hours, followed by the elevation of chart datum. You can press 1 or 2 at any time during the message to have it start again, or press 0 to end the call. Call (905) 336-4844 (Fax 905-336-8916 or chs@cciw.ca) to report any problems or to obtain additional information.

Lake Superior	at Thunder Bay	(807) 344-3141
	at Rossport	(807) 824-2250
	at Michipicoten	(705) 949-1886
	at Gros Cap	(705) 779-2052
St. Marys River	above the lock	(705) 949-2066
	below the lock	(705) 254-7989
North Channel	at Thessalon	(705) 842-2215
	at Little Current	(705) 368-3695
Georgian Bay	at Parry Sound	(705) 746-6544
	at Collingwood	(705) 445-8737
Lake Huron	at Tobermory	(519) 596-2085
	at Goderich	(519) 524-8058
St. Clair River	at Point Edward	(519) 344-0263
	at Port Lambton	(519) 677-4092
Lake St. Clair	at Belle River	(519) 728-2882
Detroit River	at Amherstburg	(519) 736-4357
Lake Erie	at Bar Point	(519) 736-7488
	at Kingsville	(519) 733-4417
	at Erieau	(519) 676-1915
	at Port Stanley	(519) 782-3866
	at Port Dover	(519) 583-2259
	at Port Colborne	(905) 835-2501
Lake Ontario	at Port Weller	(905) 646-9568
	at Burlington	(905) 544-5610
	at Toronto	(416) 868-6026
	at Cobourg	(905) 372-6214
	at Kingston	(613) 544-9264
St. Lawrence River	at Brockville	(613) 345-0095
	at Iroquois above lock	(613) 652-4426
	at Iroquois below lock	(613) 652-4839
	at Morrisburg	(613) 543-3361
	at Cornwall	(613) 930-9373
	at Summerstown	(613) 931-2089



Volume 4, Number 7

July 5, 1996

Lakes Superior and Ontario Remained Steady In June Heavy Rainfall Over Lower Basin for Third Month

A combination of heavy rainfall and below normal temperatures, which limited evaporation, led to a rapid rise in levels of the middle Great Lakes for the second month in a row.

Although Lake Huron and Lake Erie levels are currently about 20 cm and 30 cm respectively above their seasonal averages, they are still well below the record highs that occurred in 1986. Nonetheless, current conditions indicate somewhat above average levels for the coming fall, which is typically considered a stormy season. If this wet trend should continue, there could be some localized flooding and increased erosion during fall storms.

After undergoing a rapid rise in water level in May, the

levels of Lakes Superior and Ontario remained virtually unchanged during June.

Lake Ontario's level last month was probably this year's peak. The heavy June rainfall prevented any decline in the lake's level, and a wet summer could raise its level slightly. Further increases in the level of Lake Superior are expected this summer.

(continued on next page)

Gate Opened At Compensating Works

On June 24, Lake Superior's outflow was increased by opening an additional gate at the Compensating Works in the St. Marys River. This makes it three gates fully opened and has increased the flow in the St. Marys Rapids.

The decision to increase outflow by opening an additional gate was prompted by above average levels on Lake Superior over the past two months.

Our May issue of LEVEL News explained that on-going repairs at the 16-gated Compensating Works has limited the number of gates that can be used to discharge flow. Changes in repair techniques made it possible to open one additional gate without hampering the repair effort.

Despite the flow increase, Lake Superior's outflow remains less than the amount specified by the regulation plan.

The outflow of Lake Ontario in June averaged 8330 m³/s. This was slightly more than the amount specified by the regulation plan and above June's long-term average of 7840 m³/s. Lake Superior, the other lake that is also regulated, had an outflow of slightly less than the amount specified by the regulation plan, due to ongoing repairs at the St. Marys River's compensating works.

Water levels at the Port of Montreal declined rapidly from their peak values in May to near seasonal average conditions by early June. While levels are expected to decline further in July, they should remain well above chart datum.

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June Precipitation Over Great Lakes

As a percentage of the long-term June average:
Great Lakes Basin, 129%
Lake Superior, 119%
Lakes Michigan-Huron, 128%
Lake Ontario, 144%

NOTE: These figures are preliminary

Heavy Turnout at **Public Meetings**

Heavy turnout at two recent meetings showed that Great Lakes water levels remain a key and even contentious issue.

At the June 3 public meeting in Watertown, New York, hosted by the IJC's International St. Lawrence River Board of Control, 45 people attended and more than 20 of them made presentations. The Lake Ontario shore property owners and area elected officials expressed concern with high water levels and ongoing erosion problems. On the other hand, recreational boaters and marina operators in eastern Lake Ontario and the Thousand Islands area of the St. Lawrence River expressed a preference for higher levels. Representatives of environmental interests indicated a desire for somewhat more natural level and flow fluctuations.

The June 18 public meeting in Paradise, Michigan drew 35 people. Area residents told the International Lake Superior Board of Control of on-going erosion in the Whitefish Bay area, and expressed concern that a high Lake Superior level is accelerating the process. During June, Lake Superior was 12 centimetres above average.

The heavy turnouts at both meetings may be partially attributed to the recent rapid rise of levels on the Great Lakes, brought about by higher-than-average precipitation in late April and May.



Volume 4, Number 8

Lake Superior Levels Expected to Rise **Further in August**

This year's peak levels on Lake Ontario and Lake Erie appear to be behind us, but Lakes Michigan-Huron and particularly Lake Superior are expected to rise further in August.

AUG 14 1996 Lake Ontario levels declined steadily during July. Although slightly of high inflows from Lakes drier weather prevailed on the Lake Erie basin in July, the decline in Lake

Erie's level has been slow. This was due to the continued Michigan-Huron and runoff from the Lake Erie basin (continued on next page)

Lake Information on the World Wide Web

The availability of information on the World Wide Web is growing by leaps and bounds. However, a major stumbling block for users is knowing what is out there and where to look for it.

Previous articles in this newsletter have discussed information available through the Great Lakes Information Management Resource (GLIMR) as well as at other locations on the Web. In an effort to improve the ease with which lake-related data can be located, a page with links to many sources of data has been created on GLIMR. The page has links to sources of recent, historic and forecasted water levels, and it also contains links to sources of data on precipitation, wind, waves, currents, flows, water temperature, and ice cover.

The page can be accessed at the following Universal Resource Locator: http://www.cciw.ca/glimr/water-levels/intro.html

Also contained on this page are links to homepages for the International Joint Commission's International Lake Superior and International St. Lawrence Boards of Control. These homepages contain access to the Boards' brochures (see article below), as well as other information on their activities.

We will be updating this page on GLIMR as more information becomes available through the Web.

caused by the rain in June.

Similar to Lake Erie, Lake St. Clair levels have declined by only a small amount during July. The seasonal rise in levels seems to have halted on Lakes Michigan-Huron at the end of July but may continue again in August.

Rainfall on the Lake Superior basin continued to be above average during July. Lake Superior levels rose during July, and further increases are expected for August. Repairs at the Canadian and U.S. hydropower stations, and the control dam (Compensating Works), all located on the St. Marys River at Sault Ste. Marie, have limited the amount of Lake Superior outflow that can be released. The International Lake Superior Board of Control is directing maximum possible flows through these facilities. Repairs at the

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July Precipitation Over Great Lakes

As a percentage of the long-term July average:

Great Lakes Basin, 127% Lake Superior, 151% Lakes Michigan-Huron, 119% Lake Erie, 111% (including Lake St. Clair) Lake Ontario, 108%

NOTE: These figures are preliminary

Compensating Works are progressing well.

The Great Lakes escaped the brunt of the weather system that caused disastrous flooding in the Saguenay-Lac St.
Jean region in Quebec.
However, the same weather system dumped plentiful rain on the Ottawa River basin, causing a temporary rise in the levels of the St.
Lawrence River at Montreal and downstream.

Montreal Harbour levels were well above average in July. Levels are expected to remain well above chart datum for August.

Water levels on the upper lakes remain somewhat above average and if the conditions remain unchanged for the coming fall, storms could cause some localized flooding and increased erosion.

IJC Boards of Control Brochures

The International Lake
Superior, International
Niagara, and International St.
Lawrence River Boards of
Control have each prepared a
brochure describing the
Board's function and
activities. The brochures are
accessible through GLIMR
on the World Wide Web, and
they are also available from
our Burlington and Cornwall
offices.



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September 6, 1996

Level Continued to Rise Despite Maximum Possible Outflow High Lake Superior Water Level a Concern

During August the
International Lake Superior
Board of Control allowed
maximum possible Lake
Superior outflows to counter
the rising level on that lake.
Despite these efforts, the
lake's level continued to
slowly rise during most of the
month.

In recent issues, we have discussed the ongoing major repairs at the Compensating Works located in the St. Marys River above the rapids. To ensure worker safety, it was possible to use only three of its 16 gates to release water from Lake Superior. Thanks to an early completion of the repair to the Canadian half of the structure, two more gates were opened on August 22, bringing the total Lake Superior outflow closer to, but still slightly less than the

amount specified by the regulation plan.

In an effort to increase the Lake Superior outflow, the U.S. Army Corps of Engineers opened one of its navigation locks at Sault Ste. Marie, Michigan on August 12. However, concerns about the potential for major structural damage to the lock gates necessitated termination (continued on next page)

Low Levels on Lake St. Lawrence

The control point for Lake Ontario regulation is the hydropower dam in the St. Lawrence River. High flows through the dam during the last three months caused a decline in levels on the upstream side of the dam, leading to very low water levels in the river between Cornwall and Iroquois, an area known as Lake St. Lawrence. In contrast, one year ago when Lake Ontario levels were below average and flows at the dam low, Lake St. Lawrence had above average water level conditions.

Water levels in Lake St. Lawrence in early August were as much as 45 cm below seasonal average. To help alleviate the problems faced by recreational boaters on Lake St. Lawrence, the International St. Lawrence River Board of Control has agreed to reduce the flows at the dam. While the improvement has been marginal, the Board's action has thus far prevented further worsening of the situation.

of this action later in the day. As an alternative, small flows were passed through ice and tainter gates that form part of the U.S. Government power plant.

At the beginning of September, Lake Superior was 21 cm above the seasonal average, a condition brought on by the heavy. snowmelt this past spring followed by a rather wet summer. About four cm of this water is due to flow limitations to accommodate the repairs at the Compensating Works. While the level at the beginning of September remained very high, it was 13 cm below the maximum recorded in October 1985. It appears that the lake's level has peaked

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August Precipitation Over Great Lakes

As a percentage of the long-term August average:

Great Lakes Basin, 64% Lake Superior, 88% Lakes Michigan-Huron, 54% Lake Erie, 34%*
(including Lake St. Clair)
Lake Ontario, 80%

* Record low for Lake Erie NOTE: These figures are preliminary

for the year, and should start to decline during September, although further heavy rainfall could cause a slight rise in its level.

Repairs on the U.S. portion of the structure are expected to be completed by September 20. At that time, more gates will be opened to increase Lake Superior's outflow and help draw down the lake prior to the fall storm season.

Flows at the three hydropower plants in the St. Marys River, which make up the largest portion of the St. Marys River flow, continued to be at their capacities.

Middle Lakes Reached Season's Peak

Lakes Huron, St. Clair and Erie appear to have peaked this year, at levels as much as 35 cm higher than average, and have begun to decline. Drier than average conditions during August, the first dry period in several months,

helped to accelerate the drop of Lake Erie's level. A continued decline in the levels is expected the rest of the year, and serious flooding problems are unlikely through autumn.

Lake Ontario Level Declines Steadily

After reaching its peak in June some 20 cm above average, the level of Lake Ontario has been declining. With the high levels, the outflows of the lake during this past summer have also been significantly higher than average. The flows are expected to remain high as the lake was three cm above average at the beginning of September.

Montreal Harbour levels were well above chart datum in August, and are expected to remain well above datum for September.

LE LA ENS

Volume 4, Number 10

October 7, 1996

Hurricane Fran Passes Over Lower Lakes OCT 16 1996 Decline of Lake Levels Slowed by Wet Weather

The seasonal decline in lake levels was slowed considerably in September, primarily by the effects of heavy rainfall. The onset of wet conditions began with the passage of Hurricane Fran over lower portions of the basin during the first week of September. Rainfall occurred

frequently over most of the basin during the rest of the month, the exception being the Lake Superior basin.

As a result of the rainfall, daily levels on all of the lakes had declined by 4 centimetres or less from the beginning of September to the end of the month. Lakes St. Clair and Huron were actually slightly higher at the end of the month than at the start. At the beginning of October, lake levels were above average, by 30 cm on Lake Huron, 45 cm on Lakes St. Clair and Erie, and 12 cm on Lake Ontario.

Lake Superior Outflow Increases Following Repair Completion

Completion of repairs on September 20 at the Compensating Works in the St. Marys River enabled all gates at the dam to be opened, in order to increase the Lake Superior outflow.

Since May, repairs to the dam have restricted Lake Superior outflows to amounts less than those specified by the regulation plan. As a result, about 5 cm of extra water was retained on Lake Superior by the end of August.

Having all 16 gates open for the last ten days of the month, and maximum possible flows through the three near-by hydropower plants (which bypass the dam), brought the Lake Superior outflow to that specified by the regulation plan for the month of September. Outflows in October and November are expected to be very high and significantly above that specified by the regulation plan.

The high Lake Superior level conditions this summer have led to numerous concerns expressed by property owners, for example in Thunder Bay, Ontario and in the Whitefish Bay area in Michigan.

At the beginning of October, Lake Superior's level remained about 20 cm higher than average for this time of year. It appears that the level has reached this year's peak and has begun it's seasonal decline. To eliminate the water previously retained on Lake Superior as soon as possible, the International Lake Superior Board of Control will keep all 16 gates open at the dam until mid-November.



Rainfall Extremes on Erie Basin

What a difference a month makes! During August, rainfall over the Lake Erie drainage basin was a record low, according to preliminary data, with less than 3 cm falling during the entire month. The first five days of September were also dry, but then Hurricane Fran arrived. Since then about 20 cm of rain has fallen over the basin, a record high. London received over 30 cm, or one foot.

Compensating Works Trivia

As mentioned in an article above, all 16 gates in the St. Marys River compensating works are fully open, allowing water to flow through them. The last time all the gates

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September Precipitation Over Great Lakes

As a percentage of the long-term September average:

Great Lakes Basin, 142%
Lake Superior, 105%
Lakes Michigan-Huron, 126%
* Record high for Lake Erie

Lake Erie, 249%*
(including Lake St. Clair)
Lake Ontario, 191%

NOTE: These figures are preliminary

were open was November 1982. At that time, Great Lakes Power Company's hydroelectric plant on the St. Marys River was under reconstruction and no water was flowing through it, so it was necessary to have all the gates open in order to achieve the required discharge from Lake Superior.

Great Lakes Atlas Available

As mentioned several months ago, the third edition of the Great Lakes Environmental Atlas and Resource Book is available for purchase. This 46 page colour atlas contains a wealth of information on the Great Lakes, their environment, and human activities within their basin.

The Atlas is available in English and French, for \$19.95 per copy plus GST and shipping and handling. If you wish to obtain a copy, please send a cheque or money order payable to "The Receiver General for Canada" for \$25.09 to our Burlington location listed in the "For More Information" box.

Water Held on Ontario to be Discharged

The International St.
Lawrence River Board of
Control has decided to remove
the 2 cm of water retained on
Lake Ontario, which resulted
from Lake Ontario outflows
being less than regulation plan
earlier this year. Over the
next several weeks, the flows
will be more than the amount
specified by the regulation
plan to eliminate the water
retained on the lake.

End of Seasonal Subscription

For those of you who receive the Level News and Bulletin from spring to fall only, this is the last issue until early May... If you are on the year-round subscription list but have found that you only need the Level News and Bulletin from spring to fall, we would be glad to switch you to the seasonal list in order to reduce our costs. To make the switch, please contact us at the address, phone or fax number listed on the back of the Bulletin.



Volume 4, Number 11

November 7, 1996

MOV 13 1006

Risk of Damage to Shore Properties Wet Weather Slows Decline of Middle Lakes'

Lingering effects of a very wet September has slowed the seasonal decline of levels on the middle Great Lakes.

While rainfall amounts during October were relatively close to average, runoff to the lakes was higher than average due to the high levels of inland lakes and rivers and wet soil conditions. As a result of this high inflow, combined with record high inflow from Lake Superior (see article below), Lakes Michigan-Huron declined by a very small amount during October and remained 37 cm above average at the start of November. Lakes St. Clair and Erie had slightly larger drops in their levels, but both remained 40 cm above average.

If wet conditions should continue, the levels of these (continued on next page)

HIGH LAKE SUPERIOR OUTFLOW SPEEDS UP WATER LEVEL DECLINE

Very high flows in the St. Marys River during October helped to decrease Lake Superior's level by more than otherwise would have occurred during the month.

Completion of repairs on September 20 at the Compensating Works in the St. Marys River enabled all gates at the dam to be opened. This, along with flows through the three hydroelectric plants, resulted in a total river flow of about 3700 m³/s, a record high for October.

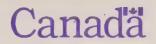
Repairs to the dam this summer had led to Lake Superior outflows less than the amounts specified by the regulation plan. As a result, 5 cm of water was retained on Lake Superior by the end of August while the levels of Lakes Michigan-Huron were lowered by 3 cm. These effects are currently being offset by higher outflows, and should be completely eliminated by mid-November.

The high flows in the St. Marys River following the opening of all 16 gates caused a rise in the river levels below Sault. Ste. Marie. There were concerns expressed by downstream property owners. However, river levels have improved somewhat since late September.

The International Lake Superior Board of Control informed that, beginning December, the winter gate open setting will take effect with one-half gate open in the main rapids and one-half gate open at the fishery remedial dike. All other gates will be closed gradually in November to avoid large flow fluctuations in the river.

At the beginning of November, Lake Superior's level was 21 cm higher than average. Wetter than average conditions over the lake's drainage basin during October prevented a larger decline in the lake's level. The level is expected to continue to decline the rest of this year.





lakes will remain relatively close to their present level over the next three months. Drier conditions over that period could result in a decline of up to 20 cm in the levels of these lakes.

With the fall storm season upon us and lake levels significantly above average, there is a moderate risk of damage to shore properties during severe storms. This risk will continue until ice forms a protective barrier along the shore.

Low Lake St. Lawrence Levels

High flows over the past two months at the Moses-Saunders power dam at Cornwall has led to extremely low levels above the dam on Lake St. Lawrence. The low levels have been a concern to navigation and to recreational boaters who were

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October Precipitation Over Great Lakes

As a percentage of the long-term October average:

Great Lakes Basin, 119% Lake Superior, 143% Lakes Michigan-Huron, 107% Lake Erie, 120% (including Lake St. Clair) Lake Ontario, 117%

NOTE: These figures are preliminary

taking their boats out of the water for the winter. The low level problem was aggravated on several occasions by strong easterly winds. Occasionally, flows at the power dam have been temporarily reduced to avoid excessively low levels above the dam.

The water level of Lake Ontario had just about returned to average at the end of August when abundant rain arrived, brought on first by Hurricane Fran in early September and later on by other weather systems. In response to the high water supplies to Lake Ontario, the regulation plan has specified high outflows. This has helped to lower Lake Ontario's level, but created this problem on Lake St. Lawrence.

Lake Ontario's level remained 13 cm above average at the start of November.

Lake St. Louis and Montreal Levels Ideal

Except in April and May, when snow melt in the Ottawa River basin posed a threat of flooding, water levels in the St. Lawrence River below Cornwall have been close to ideal for the past several months. Sufficiently

high levels in the spring provided favourable levels for fish spawning, while recreational boating and commercial navigation enjoyed levels at or slightly above average during the summer and early fall months.

High flows from Lake Ontario and the Ottawa River are expected to maintain levels at Montreal well above chart datum in November.

Severe Storm Envelops Great Lakes

Strong westerly winds accompanied a severe storm that affected all of the Great Lakes on October 30.

Wave heights of over 6 metres were reported on Lake Superior, while steady winds of 95 kilometres per hour and gusts of 110 kilometres per hour occurred at Port Colborne on Lake Erie. The strong winds created a surge in Lake Erie's level of 150 cm at Port Colborne.

Preliminary reports indicated that some localized flooding over roads and parks occurred at the eastern end of Lake Erie.



Volume 5, Number 1

January 6, 1997

Water Levels Ended 1996 Well Above Average

Water levels on the Great Lakes, which started 1996 at average, have risen to well above average by the end of the year, posing a serious risk of flood damage for the coming spring.

December was another wet month with above average precipitation on the Great Lakes basin. The total amount for 1996, estimated at 934 mm, was 14% above average, and the highest of the past six years. All the lakes had above average precipitation on their basins in 1996.

During December, very little change in levels occurred on the upper lakes, while Lake St. Clair, Lake Ontario and particularly Lake Erie rose. Lake Superior started 1997 22 cm above average, while Lakes Michigan-Huron, St.

Clair and Erie were 42 to 55 cm above average. Lake Ontario was 23 cm above average.

Fortunately, damage to shore property was minimal during the month, due to an absence of severe wind storms. However, mild conditions delayed formation of ice along shorelines, leaving the shores expand to wave action into January.

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High St. Lawrence River Flows

At the end of December, ice had not yet formed in the St. Lawrence River, due to a rather mild month. As a result, the International St. Lawrence River Board of Control was able to direct Lake Ontario outflows well above the amounts specified by the regulation plan. By early January, the overdischarges were equivalent to a 20 cm lowering effect on Lake Ontario. The Board will maintain outflows as high as possible in order to reduce

the risk of flooding on Lake Ontario this spring.

An absence of ice in the St. Lawrence River also enabled a smooth closing on December 26 of the navigation season between Lake Ontario and Montreal. In contrast, ice arrived early in December 1995, which posed severe difficulties to navigation and necessitated Lake Ontario outflow reductions.

December Precipitation Over Great Lakes
As a percentage of the long-term December average:

Great Lakes Basin, 134% Lake Superior, 111% (in Lakes Michigan-Huron, 151% La NOTE: These figures are preliminary

Lake Erie, 118% (including Lake St. Clair) Lake Ontario, 132%

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Volume 5, Numéro 1

Le 6 janvier 1997

Niveaux d'eau largement supérieurs aux moyennes en cette fin d'année

Les niveaux d'eau des Grands Lacs, qui se situaient dans les moyennes au début de 1996, les ont largement dépassées vers la fin de l'année, entraînant même un sérieux risque d'inondation pour le printemps.

Les précipitations dans le bassin des Grands Lacs pour le mois de décembre ont été supérieures à la moyenne. On estime qu'il est tombé 934 mm de pluie en 1996, soit 14% de plus que la normale, ce qui constitue le plus fort taux de

précipitation des six dernières années. Tous les lacs ont connu des précipitations supérieures aux moyennes sur leurs bassins en 1996.

Au cours du mois de décembre, les niveaux des lacs supérieurs sont restés plus ou moins stables, alors que ceux des lacs Sainte-Claire, Ontario, et surtout Érié, ont augmenté. Le lac Supérieur a amorcé l'année 1997 à 22 cm audessus de la moyenne; les niveaux des lacs Michigan-Huron, Sainte-

Claire et Érié étaient de 42 à 55 cm supérieurs aux moyennes. Le lac Ontario, pour sa part, était à 23 cm au-dessus de la moyenne.

Heureusement, il y a eu très peu de dommages causés aux propriétés riveraines durant le mois, en raison de l'absence de tempêtes de vent importantes. Toutefois, le temps doux a retardé la formation de glace le long des rives. Celles-ci ont donc subi l'action des vagues jusqu'au mois de janvier.

Le fleuve Saint-Laurent connaît un fort débit

Vers la fin de 1996, le fleuve encore Saint-Laurent était dépourvu de glace en raison d'un mois de décembre plutôt clément. Conseil international Le contrôle du fleuve Saint-Laurent a même pu augmenter sensiblement le débit versant du lac Ontario qui avait été fixé par le plan de régularisation. Au début du mois de janvier, le surplus déversé avait entraîné une réduction de 20 cm du niveau du lac Ontario. Le Conseil prévoit maintenir le débit versant à un niveau aussi élevé que possible, de sorte à réduire le risque d'inondation dans la région du lac Ontario au cours du printemps prochain.

L'absence de glace sur le fleuve Saint-Laurent a aussi permis, le 26 décembre, de mettre fin sans problèmes à la saison de navigation entre le lac Ontario et Montréal. Comparativement, la glace s'était formée très tôt en décembre 1995, ce qui avait beaucoup nui à la navigation et forcé des mesures de réduction du débit versant du lac Ontario.

Grands Lacs - Précipitations en décembre

Pourcentage de la moyenne à long terme pour décembre

Bassin des Grands Lacs, 134% Lac Supérieur, 111% Lacs Michigan et Huron, 151% Lac Érié, 118% (y compris le lac Sainte-Claire) Lac Ontario, 132%

NOTE: Ces chiffres sont préliminaires.





Volume 5, Number 2

February 7, 1997

Above Average Precipitation Amounts Continued

High Great Lakes Water Levels Expected for Spring 1997

Great Lakes water levels could be very high this spring. Concern over the situation is growing as there exists a significant risk of serious shoreline flood and erosion damage.

January was the sixth month out of the past eight with above average precipitation. This was

a continuation of the conditions experienced during 1996. which was the fifth wettest year this century over the Great Lakes Basin.

The fall and early winter months are usually a period during which levels of the lakes decline, but wet conditions have slowed this year's decline.

Lakes Huron and Erie's levels typically drop by about 30 cm from July to January, but this year Lake Huron only declined 5 cm over the period, while Lake Erie's level decreased by just over 10 cm.

At the end of January, Lakes Huron and Erie levels were (continued next page)

IJC Takes Measures to Deal With High Lake Ontario Levels

Concern over above average levels and continuing high supplies of water to Lake Ontario led the International Joint Commission to invoke Criterion (k) in the regulation of the outflows of Lake Ontario on January 17. By this measure, the IJC places a priority on providing relief to shoreline property owners on Lake Ontario and the St. Lawrence River as far downstream as Montreal. Under Criterion (k) operations, the IJC's International St. Lawrence River Board of Control will direct maximum possible outflows when appropriate without causing downstream flooding.

Prior to the implementation of Criterion (k), the Board had frequently deviated from the regulation plan over the past several months in an effort to alleviate water level concerns. Flows were much higher than those specified by the plan between December 26, when the St. Lawrence Seaway closed for the winter, and January 8, when ice formation started. To promote formation of a stable ice cover and prevent ice jams, the Board reduced Lake Ontario outflows on January 8, and subsequently increased the flow gradually as the ice cover strengthened.

As of January 29, deviations from Lake Ontario's regulation plan has lowered the lake's level by 31 cm from that which would have occurred through strict adherence to the plan, and the lake's level was 59 cm lower than it would have been under natural conditions (i.e. with no regulation of water levels).



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45 to 55 cm higher than average for that time of year. Both lakes experienced a slight increase in levels over the past month. Despite this increase, they were still about 30 to 40 cm below record high levels. Lake Superior's level, about 25 cm above average, is expected to continue to decline for a few more weeks. Meanwhile, Lake Ontario's level (currently 32 cm above average) has been rising slowly since December, and indications are that this trend will continue.

If wet conditions should continue over the next six months, this spring's levels on all lakes except Ontario could be within 10 to 20 cm of the record highs established in the mid 1980's, and this summer's levels could be within 10 cm of the record highs.

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Aussi disponible en français

January Precipitation Over Great Lakes

As a percentage of the long-term January average:

Great Lakes Basin, 150% Lake Superior, 132% Lakes Michigan-Huron, 180%* Lake Erie, 100% (including Lake St. Clair) Lake Ontario, 140%

* New record maximum

NOTE: These figures are preliminary

Lake St. Clair Level Rises Quickly

Water levels on Lake St. Clair rose by over 30 cm between the 7th and the 17th of January. This rapid rise in levels was caused by a build-up of ice in the Detroit River, particularly in the Livingstone Channel and north of Fighting Island. Ice breakers were dispatched to keep the ice moving downstream, and by the end of January the lake's level had declined by 17 cm. Levels in the St. Clair River also increased in response to the rise on Lake St. Clair. Local agencies reported receiving many calls from concerned residents.

Public Meetings

The annual public meetings of the International Lake Superior Board of Control and the International St. Lawrence River Board of Control alternate between Canada and the United States. This year, the Boards have tentatively selected Thunder Bay and Brockville, respectively, for their meeting locations. We will update you in the next issue.

Lake Ontario Information via Internet

This is a repeat of an earlier article, for the benefit of those who have recently obtained Internet access.

The International St. Lawrence River Board of Control provides a weekly distribution of up-to-date information on levels and flows in Lake Ontario and the St. Lawrence River to people with Internet access. If you wish to subscribe to this list (at no cost), send an email message to majordomo@cciw.ca with the Subject box left blank and two lines of text in the message body. The first line should be subscribe stlaw-l and the second line should be end. Note that after stlaw is the letter "l", not the number one.

An updated report on conditions is sent to all subscribers on Thursday of each week.

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GREAT LAKES-ST. LAWRENCE RIVER WATER LEVELS

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Volume 5, Number 3

March 7, 1997

Concerns Continue to Escalate

High Water Level Situation Worsens on Middle Lakes

Water levels on Lakes Huron, St. Clair and Erie increased rapidly during February, and concerns that flooding and storm damage will be experienced this spring and summer increased with the levels. It was another month with above average amounts of precipitation over the basins of these lakes, with heavy rainfall on the 20th-21st and again on the 26th-27th aggravating the situation.

February is often a month during which levels of the middle lakes are static, but this year the levels of Lakes Huron, St. Clair and Erie increased by 7, 18, and 22 cm, respectively, from the beginning to the end of the month. Most of this increase occurred in the last few days of February, so it is not fully reflected in the monthly average levels.

The heavy rainfall events that affected much of the Great Lakes basin passed to the south of Lake Superior's basin. It was a dry month over Superior's basin, and temperatures below freezing for most of the month limited

snowmelt in that area. As a result, the lake's level declined by an average amount during the month.

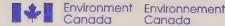
Water levels on most of the lakes (except Lake Ontario) during February were similar to those of February 1973 and February 1985. Severe storm and flooding damages were experienced along portions of the shoreline in the springs of both those years, and there is a strong possibility that similar events could occur again this year.

(continued on next page)

Water Level Conditions Improve Slightly on Lake Ontario

Record high outflows from Lake Ontario during February slowed down the increase in levels of the lake. Formation of a stable ice cover on the St. Lawrence River by the end of January permitted the International St. Lawrence River Board of Control to steadily increase outflows throughout the month.

The high outflows during February helped to offset above average water supplies to the lake caused by high inflows from Lake Erie and high local runoff, with the result that Lake Ontario's level increased by an average amount during the month.







Ice cover on the lakes and shorefast ice along the shoreline help to reduce the risk of storm damage during the winter and spring. A relatively late freezeup on Lake Erie and mild weather in late February has resulted in open water over most of the western half of Lake Erie by the end of February. It is possible that the protection afforded by ice cover will be lost relatively early this spring over much of Lake Erie.

If above average amounts of rainfall and runoff should continue over the next several months, water levels on Lakes Superior, Huron, St. Clair and Erie could rise to within 10 cm of the record highs of 1986 by late spring.

Lake Ontario and St. Lawrence River Information

The International St. Lawrence River Board of Control has implemented a toll free telephone service that provides brief information on water levels for select locations on Lake Ontario and the St. Lawrence River. As well, information is provided on the Lake Ontario outflow and some other current situations. This information is updated at least

February Precipitation Over Great Lakes

As a percentage of the long-term February average:

Great Lakes Basin, 142% Lake Superior, 51% Lakes Michigan-Huron, 184% Lake Erie, 178% including Lake St. Clair)
Lake Ontario, 113%

NOTE: These figures are preliminary

once a week and is available in both official languages.

The toll free number for English is 1-800-215-8794 and for French is 1-800-215-9173.

Ice Data on WWW

Last year we provided a URL address at which ice cover data for the Great Lakes was available from the National Weather Service. That address is no longer functional, but similar ice cover data is available at: http://www.natice.noaa.gov/.

This is a site operated by the National Ice Center of the United States government.

Outflow Data

At the suggestion of a reader, data on lake outflows for the past month have been added to Level News. Initially, data for Lakes Superior and Ontario have been included, since they are regulated and the data are

readily available. We hope to include data for the other lakes in the coming months.

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February Outflows From Great Lakes

As a percentage of the long-term February average:

Lake Superior 125% Lake Ontario 131% NOTE: These figures are preliminary

Volume 5, Number 4

April 7, 1997

Large Runoff to Upper Lakes Anticipated **High Water Levels Pose Serious Threat of Spring Flooding**

Water levels on all of the Great Lakes except Lake Superior continued to climb during March. Levels have reached an elevation where they pose a very serious threat of flood and storm damage to shoreline properties during this spring. While the risk of damage is greatest along the shores of

Lakes Erie and St. Clair, it is a cause for concern along all the Great Lakes' shores.

Last month, Lake Erie had the biggest jump in the levels, and the average for the month was just nine centimetres shy of the previous March maximum, which occurred in 1986. By the beginning of

April, both Lake Erie and Lake St. Clair were about 70 cm higher than average.

The beginning of April levels on the other lakes were also well above average, by 24 cm on Lake Superior, 53 cm on Lake Michigan-Huron and 33 cm on Lake Ontario. (continued on next page)

Record Outflows Slowed Lake Ontario Level's Rise

For the second consecutive month, the outflow of Lake Ontario in March was a record high for the month. The outflow in March was maintained as high as possible by the International St. Lawrence River Board of Control without causing flooding downstream of Cornwall, Ontario, or disturbing the ice cover in the river. The high outflow has helped slow down the seasonal rise in Lake Ontario's level, in spite of the continued very high inflow from Lake Erie and Lake Ontario's own basin. However, the lake's level still increased by 14 centimetres between the first and last days of the month.

The high Lake Ontario outflow to date is estimated to have lowered Lake Ontario by 70 centimetres, in comparison to the level that would have occurred had the seaway and project not been built.

The Board is expected to direct some reductions in the Lake Ontario outflow during the Ottawa River freshet, which is anticipated to occur sometime in April. Flow reductions are necessary in order to avoid serious flooding in the Montreal area.



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Further rises in the levels of the lakes are forecast for the next few weeks. Surveys of the snowpack have indicated that an above average amount of water exists in the form of snow over much of the drainage basins of Lakes Superior and Huron, which could lead to a large spring runoff to these lakes. An extremely wet spring could raise the levels on Lakes Superior, Huron, and St. Clair very close to the record highs of 1986-87, and it could push Lake Erie's level above previous record highs.

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March Precipitation Over Great Lakes

As a percentage of the long-term March average:

Great Lakes Basin, 118% Lake Superior, 122% Lakes Michigan-Huron, 93% Lake Erie, 134% including Lake St. Clair) Lake Ontario, 138%

NOTE: These figures are preliminary

If precipitation amounts over the next several months are near average, then levels of all the lakes will remain below previous record highs.

Public Meetings

The annual public meeting of the International Lake Superior Board of Control will take place on the evening of Tuesday, June 17, at the Lakehead Region Conservation Authority in Thunder Bay, Ontario. The International St. Lawrence River Board of Control will hold its evening public meeting in Brockville, Ontario, at the Royal Brock Hotel on Wednesday, July 2.

Water Level Bulletin on the Web

If you access the monthly Water Level bulletin through the World Wide Web, it's location has changed. It can now be located at: http://chswww.bur.dfo.ca/da np/wlgraphs.html. Also, hourly data for Canadian lake level gauges can be accessed at: http://chswww.bur.dfo.ca/da np/hourly.html.

March Outflows From Great Lakes

As a percentage of the long-term March average:

Lake Superior 127% Lake Huron 117% Lake Erie 136% Lake Ontario 137%

NOTE: These figures are preliminary

Volume 5, Number 5

May 7, 1997

Dry Weather Slows Increase in Lake Levels

Precipitation was below average throughout the Great Lakes basin during April, for the first month since last November. These dry conditions provided some welcome relief, as they slowed the seasonal increase in levels on Lakes Ontario, Erie and St. Clair, and they offset the high inflows from snowmelt into Lakes Superior and Huron. Despite this improvement, the risk of damage to shore property remains high, particularly along Lakes Huron, St. Clair and Erie. At the beginning of May, these (continued on next page)

Repairs Resume on St. Marys River Control Structure

Repair work will resume in early May on the 16-gate control structure located on the St. Marys River at Sault Ste. Marie. As a result, the flows out of Lake Superior through the St. Marys Rapids will be altered somewhat, but the impacts on Great Lakes water levels are expected to be minimal.

The U.S. Army Corps of Engineers will carry out repairs to two of the gates from early May until late September. This will require de-watering of the areas immediately upstream and downstream of the gates. Several adjacent gates will also be closed to permit work boats to safely navigate along the upstream side of the structure. As a result, about eight of the 16 gates will be available for use in the regulation of Lake Superior outflows.

The flow limitation at the structure is expected to have a minor impact on lake levels, as a large portion of the St. Marys River flow will continue to bypass the structure at three nearby hydropower plants. If the upper lakes basin turns very wet this summer, the maximum impact on Lake Superior due to the repairs would be a one centimetre rise in lake level.

To help offset the anticipated flow reductions at the control structure, the International Lake Superior Board of Control has directed more gates be opened during the last ten days of April and early May. This could temporarily raise Lake Huron's level by one to two centimetres. Upon completion of the repairs in September, it is expected that flows will be adjusted to quickly offset the impacts on levels of any over- or under-discharges that occurred as a result of the repair program.

The control structure was built between 1902 and 1919. Repairs and maintenance are the responsibilities of its owners, the U.S. Army Corps of Engineers (which owns the southern half), and Great Lakes Power Limited in Canada. The U.S. program of repairing two gates per year started in 1995, and will be completed in 1998. Great Lakes Power completed repairs to all its gates except Gate 1 in 1996.





three lakes were 52 to 56 centimetres above average levels, while Lakes Superior and Ontario were about 27 centimetres above average.

Virtually all the snow has melted on the United States' side of the Great Lakes basin, but there is still a relatively large amount of snow north of Lakes Superior and Huron. Melting of this snow through the first part of May will continue to add to the water levels of these lakes.

While the dry weather has led to some improvement in lake levels, a return to wet weather would quickly push the levels of Lakes Superior, Huron, St. Clair and Erie to within a few centimetres of previous record highs.

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April Precipitation Over Great Lakes

As a percentage of the long-term April average:

Great Lakes Basin, 61% Lake Superior, 59% Lakes Michigan-Huron, 66% Lake Erie, 55% including Lake St. Clair)
Lake Ontario, 60%

NOTE: These figures are preliminary

Ice Room Removed

Removal of the Lake Erie-Niagara River ice boom began on April 25 and was completed on April 28. The boom is installed each winter to enhance formation of a stable ice cover, which has reduced formation of ice jams in the river.

Some ice does pass over the boom, especially during. periods of strong southwesterly winds. There were several such incidents during the past winter, and a significant amount of ice collected in the Maid of the Mist pool, located immediately below the Falls. In early April, a substantial buildup of ice raised the water level of the pool, which resulted in flooding of the Ontario Power hydroelectric plant and the Maid-of-the-Mist Steamboat Company property.

Since this ice buildup occurred below Niagara Falls, it did not affect flows in the upper Niagara River, and there was no impact on Lake Erie's water level

Public Meetings

The annual public meeting of the International Lake Superior Board of Control will take place at 7:30 p.m. on Tuesday, June 17th, at the Lakehead Region Conservation Authority office, 130 Conservation Road, in Thunder Bay, Ontario. The International St. Lawrence River Board of Control will hold its public meeting in Brockville, Ontario, at the Royal Brock Hotel on Wednesday, July 2nd at 7:30 p.m.

April Outflows From Great Lakes

As a percentage of the long-term April average:

Lake Superior 128% Lake Huron 113% Lake Erie 132% Lake Ontario 122%

NOTE: These figures are preliminary

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GREAT LAKES-ST. LAWRENCE RIVER WATER LEVELS

Volume 5, Number 6

June 6, 1997

Lake Levels Continue to Increase Serious Threat of Flooding Remains

Water levels on all of the Great Lakes increased slightly more than anticipated during May. High water levels continue to pose a very serious threat of flood and storm damage to shoreline properties.

Large inflows to Lakes
Superior and Huron occurred
during the first half of May,
due to above average
snowmelt and rainfall, and
pushed up levels of these
lakes. Drier conditions
during the last half of the

month slowed the increase in lake levels.

Lakes St. Clair and Erie received above average rainfall throughout the month. Rains during the first part of (continued on next page)

Lake Ontario Peaked, but High Outflows Continue

Lake Ontario's level increased rapidly during the first half of May, but it appeared to have reached its peak for the year in the third week of the month. Lake Ontario's level during the last two weeks of May averaged about 75.36 metres, which was about 14 cm above the late May levels of one year ago, but some 25 cm below the high levels experienced in 1993. In view of continuing high levels on Lake Ontario and upstream on Lake Erie, the International St. Lawrence River Board of Control is continuing to discharge maximum possible outflows from the lake into the St. Lawrence River without endangering the safety of Seaway navigation.

Water levels on Lake St. Louis near Montreal were extremely high and just below flood stage since April 6 as a result of high flows from Lake Ontario and the Ottawa River. This risk of flooding on Lake St. Louis limited outflows from Lake Ontario during much of April and May. By late May, with Ottawa River flows declining, conditions on Lake St. Louis improved to the point where there no longer exists a threat of flooding in the Montreal area.

In order to maximize Lake Ontario's outflow during May without causing downstream flooding, outflows from the lake were changed fourteen times. These flow changes are available for viewing on the Worldwide Web at: http://sparky.nce.usace.army.mil/outflows/sgnvnts.html. At the end of May, Lake Ontario's outflow was 9600 cubic metres per second (339,000 cubic feet per second).



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the month were mostly absorbed by the land portion of the basin, and lake levels remained relatively constant during that time. However, as the rains continued, levels of these two lakes increased during the last half of the month.

The beginning of June levels on all the lakes were well above seasonal average, ranging from 23 cm on Lake Superior, to as much as 69 cm on Lake Erie.

Lake Ontario's level appeared to have peaked for the year in mid May, and its decline may have begun. Lakes Erie and St. Clair are just about at their season's peak now. Further rises in the levels of Lakes Superior and Michigan-Huron are expected in June.

Montreal Harbour levels reached their peak in early May and at times threatened

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Aussi disponible en français

May Precipitation Over Great Lakes As a percentage of the long-term May average:

Great Lakes Basin, 102% Lake Superior, 84%

Lakes Michigan-Huron, 98%

Lake Erie, 160% including Lake St. Clair) Lake Ontario, 84%

NOTE: These figures are preliminary

facilities at the harbour. The levels since then have declined, and the decline is expected to continue.

Tug Boat Mishap in the St. Marys River

On May 19, a tug boat got drawn by high currents into the upstream side of the control structure in the St. Marys River at Sault Ste. Marie. At the time, the tug was positioning a work barge to prepare for repairs to two of the sixteen gates.

There were some minor damage to a gate but no one was injured. Several open gates in the control structure had to be temporarily closed to enable salvage operations, and the tug was refloated and removed on May 24.

Lake Superior outflow during the five days was reduced from 3200 cubic metres per second to 2650 cubic metres per second. To offset the flow reduction, sluice gates at the U.S. government hydropower plant and at the Great Lakes Power Limited plant in Canada were opened after the tug was removed in order to increase flows at these plants.

Public Meetings

The annual public meeting of the International Lake Superior Board of Control will take place at 7:30 p.m. on Tuesday, June 17th, at the Lakehead Region Conservation Authority office, 130 Conservation Road, in Thunder Bay, Ontario. The International St. Lawrence River Board of Control will hold its public meeting in Brockville, Ontario, at the Royal Brock Hotel on Wednesday, July 2nd at 7:30 p.m.

May Outflows From Great Lakes As a percentage of the long-term May average:

Lake Superior 144%
Lake Huron 113%

Lake Erie 123% Lake Ontario 115%

NOTE: These figures are preliminary

L'I Mews

Volume 5, Number 7

July 7, 1997

Lake Ontario's Level Declines Levels Continue to Rise on Middle and Upper Lakes

Water levels on all of the Great Lakes except Ontario continued to rise during June. While Lake Superior's level rose less than usual during the month, the increase was larger than usual on Lakes Huron, St. Clair and Erie.

Dry conditions during the first half of June over the drainage basins of Lakes Superior and Michigan-Huron temporarily stopped the seasonal rise in levels on these lakes, but heavier rainfall during the last half of the month caused levels to resume rising. At the end of June, Lake Superior was about 20 cm above average, while Lake Huron was 58 cm above average.

Very heavy rainfall over Lakes St. Clair and Erie's drainage basin at the beginning of June caused a rapid rise in their levels. Lake Erie's level was only two centimetres below the record maximum June level for the lake, which occurred in 1986, while Lake St. Clair was 11 cm below the 1986 record maximum. At month's end Lakes Erie and St. Clair were 70 and 66 cm above average, respectively.

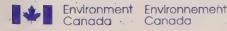
Lake Ontario also experienced dry conditions during the first half of June, and its level declined quickly. However, wetter conditions during the last half of the month temporarily stopped (continued on next page)

Heavy Rainfall Boosts Lake Erie's Level

Very heavy rainfall from May 31st to June 2nd over the drainage basins of Lakes Erie and St. Clair led to a rapid rise in the levels of these two lakes.

A low pressure centre stalled south of Lake Erie for the three day period, causing heavy rain. Land stations reported 50 to 80 millimetres of rain, while radar reports indicated even greater amounts fell over Lake Erie. While southwestern Ontario and areas to the south of Lake Erie were being deluged, the Bruce Peninsula, Muskoka, and areas to the north enjoyed warm, sunny conditions.

In response to the rainfall, Lake Erie's level rose by 17 centimetres over four days, while Lake St. Clair's level rose by 14 centimetres.









the decline. By month's end, Lake Ontario's level had declined 10 cm from this year's peak level of mid-May, but it was still 23 cm above average.

Lakes Superior and Huron are likely to continue experiencing rising levels during July, but Lakes St. Clair and Erie may be very close to their seasonal peaks for this year, and Lake Ontario's level will likely continue to decline.

If wet conditions should occur over the next several months, Lake Erie's level could equal or exceed the record highs of 1986 through the remainder of the summer. Wet conditions could cause the levels of Lakes Superior, Huron and Erie to remain 10 to 20 cm below record highs and could slow the seasonal

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June Precipitation Over Great Lakes

As a percentage of the long-term June average:

Great Lakes Basin, 97% Lake Superior, 109% Lakes Michigan-Huron, 87% Lake Erie, 104% including Lake St. Clair)
Lake Ontario, 94%

NOTE: These figures are preliminary

decline of Lake Ontario.

The risk of severe damages to shoreline properties during storms this fall is a major concern, particularly for properties along Lake Erie.

With a rapid decline in
Ottawa River flows, water
levels in Montreal Harbour
dropped sharply during June.
The monthly average level
declined by 1.12 m from the
May average, but it was still
32 cm above average. Levels
in the Harbour are expected
to continue declining over the
next several months.

Lake Superior Board of Control Public Meeting

The International Lake
Superior Board of Control
held an open house on the
evening of June 17th in cooperation with the Lakehead
Region Conservation
Authority in Thunder Bay,

Ontario. In addition to staff and local media, about 15 people, mostly residents of the north shore of Lake Superior attended the meeting. They heard the latest news about high water levels occurring throughout the Great Lakes system and learned how the Board, through the use of its regulation plan, is setting the outflows from Lake Superior to try to balance the high water levels on both Lake Superior and Lakes Michigan-Huron, Conservation Authority staff provided useful information to several questions on erosion and shore protection.

June Outflows From Great Lakes

As a percentage of the long-term June average:

Lake Superior 150% Lake Huron 110% Lake Erie 121% Lake Ontario 126%

NOTE: These figures are preliminary

Volume 5, Number 8

August 7, 1997

Drier July Offered Some Relief, but the Risk of Serious Damage Remains High

Below average rainfall in July halted a rise in the water levels on Lakes Michigan-Huron. However, readers are advised that water levels on these lakes and Lakes Superior, St. Clair and Erie will remain very high as we approach the fall season when more storms are likely to occur.

At the beginning of August, all the lakes were well above average; by 14 cm on Lake Superior, 58 cm on Lakes Michigan-Huron, 62 cm on Lakes St. Clair and Erie, and

15 cm on Lake Ontario.

A return of wet weather conditions could cause the levels of Lakes Superior and Michigan-Huron to rise again . and raise the levels of Lakes St. Clair and Erie to record highs.

After peaking in May, Lake Ontario has been declining. slowly, and the decline is expected to continue over the next few months. Lake Erie appears to have peaked in early June, with its June and July levels slightly below the

record maximums which occurred in 1986.

In the St. Lawrence River, levels at Montreal and on Lake St. Louis were above average last month, a condition brought on by high flows from Lake Ontario. Lake St. Lawrence, the area between Cornwall and Iroquois, was about one-half metre below average in July. The low levels there were due to the high flows at the : hydropower dam at Cornwall/Massena.

Repairs at Compensating Works Progressing Well

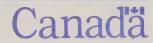
Repairs to the two gates at the 16-gate Compensating Works in the St. Marys River are expected to be completed in about two months. The structure, completed in 1921, is undergoing an overhaul that includes gate seals/sill replacement, mechanical repairs and general painting. Eleven gates have been upgraded over the past few years, and two are scheduled for 1998.

Several gates adjacent to the two being repaired are closed to ensure worker safety. The reduced capacity at the compensating works for the past two months has resulted in a small amount of water being retained on Lake Superior. For August, sufficient gates are available for regulation purposes. The required four gates open, along with the flows through the three hydropower plants that bypass the structure, should result in Lake Superior outflow as specified by regulation plan for August.



Environment Environnement





Emergency Operations remain in Lake Ontario Regulation

High Lake Ontario outflows directed by the International St. Lawrence River Board of Control have helped reduce the levels of Lake Ontario. However, the lake's level remains above average and very high flows from Lake Erie are expected to continue. As a result, the Board would most likely maintain high Lake Ontario outflows in August.

Public Meetings

The International St.
Lawrence River Board of
Control received both praise
and complaints from the
public at meetings held in
Brockville, Ontario on July
2nd. Shore property owners
on Lake Ontario were
generally satisfied with
actions taken by the Board in

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July Precipitation Over Great Lakes

As a percentage of the long-term July average:

Great Lakes Basin, 94% Lake Superior, 105% Lakes Michigan-Huron, 99% Lake Erie, 80% including Lake St. Clair) Lake Ontario, 69%

NOTE: These figures are preliminary

lowering lake levels this spring. Those who live and boat on Lake St. Lawrence, however, were not satisfied with the low water levels brought on by high flows at Cornwall/Massena. The oneday event consisted of a round-table discussion in the afternoon and a public meeting in the evening. The round-table discussion was attended by representatives of stakeholders who, in addition to discussion with the Board. had the opportunity to converse amongst themselves concerning water level issues. About 60 people attended the meetings.

Water Level Information on the Web

There is an abundance of water level and other related information available on the Worldwide Web. Historic data, data for the current and previous months, and data as recent as for the previous day are available for lake levels.

Preliminary precipitation data are also available, as are maps of precipitation during the previous day over much of the Great Lakes basin.

Other types of data available include wind speeds and directions, wave heights and water temperatures. Some of these data are updated hourly.

A good starting point for links to many of these data is at: http://www.cciw.ca/glimr/water-levels/intro.html

July Outflows From Great Lakes

As a percentage of the long-term July average:

Lake Superior 147% Lake Huron 111% Lake Erie 124% Lake Ontario 122%

NOTE: These figures are preliminary

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LAKES-ST. LAWRENCE RIVER WATER LEVELS

Volume 5. Number 9

September 8, 1997

Risk of Damage Remains High for Middle Lakes Water Levels of Great Lakes Decline

All of the Great Lakes experienced a decline in levels during August. Lake Huron had the smallest decline, with its August level averaging three centimetres lower than its July level, while Lake Ontario had the largest decline of 19 centimetres.

Dry weather throughout the Great Lakes basin during late July and the first ten days of August sparked the decline. However, wetter weather during the remainder of the month slowed the rate of decrease

The risk of severe damage to shoreline properties along Lakes Superior and Ontario has decreased considerably with the decline in water levels. At the beginning of September, Lake Superior's level was eight cm above average and Lake Ontario's level was 13 cm above average.

Along the shores of Lakes Huron, St. Clair and Erie, the risk of damage this fall remains high. While the situation has improved slightly, particularly on Lake Erie, the three lakes are still 55 to 60 cm above average

IJC Discontinues Criterion (k) Operations for Lake Ontario Outflow

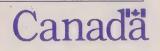
The regulation plan developed by the International Joint Commission for determining Lake Ontario outflows has several criteria for deviating from the plan under unusual conditions. Under extremely high water supply conditions, criterion (k) changes the considerations used to set Lake Ontario outflows and gives precedence to shoreline property owners on Lake Ontario and the St. Lawrence River from the Thousand Islands to past Montreal.

Last January, in response to high water supplies and rising lake levels, the IJC implemented the use of criterion (k) in setting Lake Ontario outflows. These conditions have now moderated on Lake Ontario, and the IJC has discontinued the use of criterion (k).

The International St. Lawrence River Board of Control, which sets the Lake Ontario outflow each week and ensures that it meets the requirements of the IJC, continues to have authority to deviate from the regulation plan. The Board used this authority in the fall of 1996, prior to the implementation of criterion (k), to set outflows above the amounts specified by the regulation plan when this could be accomplished without causing adverse impacts to other interests.







levels. If rainfall amounts are high over the fall months, these lakes are likely to be only 10 to 20 centimetres below the record high levels of 1986.

Lake Superior Lower than One Year Ago

During each month from
January to July of this year, the
level of every one of the Great
Lakes was higher than during
the same month in 1996. That
string was finally broken in
August, as Lake Superior's
level was ten centimetres lower
this year than in August 1996.
As a result of the improvement
in Lake Superior's level, its
outflow has been reduced by
forty percent from July to the
beginning of September.

Public Meeting

The International St. Lawrence River Board of Control is

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August Precipitation Over Great Lakes As a percentage of the long-term August average:

Great Lakes Basin, 112% Lake Superior, 62% Lakes Michigan-Huron, 136% Lake Erie, 126% including Lake St. Clair) Lake Ontario, 120%

NOTE: These figures are preliminary

hosting a series of six meetings on proposed revisions to the Lake Ontario regulation plan. The first meeting is October 9 at 7:00 p.m. in Burlington, Ontario at the Canada Centre for Inland Waters, 867 Lakeshore Road.

Lake Ontario Outflows Reduced

As mentioned in the article on the front page, the International St. Lawrence River Board of Control has authority to deviate from its regulation plan. On August 15 the Board used this discretion to reduce Lake Ontario outflows by 200 cubic metres per second, or about 2.4 percent.

The St. Lawrence River between Brockville and Cornwall has been experiencing relatively low water levels due to the high flows out of Lake Ontario. This has caused significant problems for marinas and

recreational boaters on the river. The flow reduction has improved the situation somewhat, but Lake St. Lawrence is still about 40 centimetres below average level.

The Board has implemented the flow reduction for a fiveweek period.

New Site on the Web

The Great Lakes Information
Network (GLIN) has added a
site on the Worldwide Web
devoted to Great Lakes - St.
Lawrence River hydrology.
This site contains information
on Great Lakes levels, flows,
weather and climate, contacts,
laws and news. The site can be
accessed through:
http://www.great-lakes.net/
envt/water/hydro.html. It is
highlighted as the GLIN Site of
the Month for September.

August Outflows From Great Lakes As a percentage of the long-term August average:

Lake Superior 113% Lake Huron 111% Lake Erie 121% Lake Ontario 119%

NOTE: These figures are preliminary



Volume 5, Number 10

October 7, 1997

Stormy Season BeginsLake Levels Decline Gradually During September

Water levels on all of the Great Lakes declined by about an average amount for this time of year during September. As we enter the fall storm season, the risk of severe damages to properties along Lakes Huron, St. Clair and Erie remains high.

At the beginning of October, Lakes Huron, St. Clair and Erie were all 55 to 60 centimetres above average levels. While these lakes were 25 to 40 centimetres below their record high levels of October 1986, they are very close to levels in October 1972 and October 1985. Considerable damage to shore property was experienced during the fall and winter of both those years.

Water levels on Lakes Superior and Ontario at the beginning of October were 8 (continued on next page)

Lake Ontario/St. Lawrence River Regulation Plan Revisions

The International Joint Commission is seeking public comment on a proposed regulation plan for Lake Ontario outflows that would make minor adjustments to the regulation of water levels on the lake and St. Lawrence River as far downstream as Trois Rivières, Québec.

The proposed regulation plan builds on over 30 years of experience with the current regulation plan, Plan 1958-D, and includes many of the deviations from Plan 1958-D that are currently made to address various water supply conditions.

The Commission and its International St. Lawrence River Board of Control invite the public to learn about the new plan and to provide comments at a series of public meetings.

Public meetings will be held October 16 in Dorval, Québec at the Sarto Desnoyers Community Centre, 1335 Lakeshore Drive; October 29 in Kingston, Ontario at the public library, 130 Johnson Street; and November 14 in Massena, NY. Each meeting will take place from 7:00 p.m. until 9:30 p.m. Meetings will also be held in Brockport NY and Sodus Point NY. For more information, or to receive a report about the new plan, contact Ed Eryuzlu at (613) 990-5617.

and 14 centimetres, respectively, above average levels. The levels of these two lakes have been moving closer to average over the past several months, and the risk of severe damage to properties along their shores this fall is minimal.

It is anticipated that water levels of all the Great Lakes will continue to decline through the remainder of the fall. If very heavy rainfall should occur over that time, the decline in levels could be minimal, as was the case for most of the lakes last fall.

Open House

The International Niagara Board of Control is holding an open house on Thursday, October 30, 1997 at 7:30 p.m., at the Queen's Landing Inn, 155 Byron Street

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September Precipitation Over Great Lakes

As a percentage of the long-term September average:

Great Lakes Basin, 92% Lake Superior, 66% Lakes Michigan-Huron, 92% Lake Erie, 130% including Lake St. Clair) Lake Ontario, 125%

NOTE: These figures are preliminary

Niagara-on-the-Lake,
Ontario. The purpose of this
open house is to inform the
public of the Board's current
activities and to hear public
comments and suggestions
regarding the Board's work.
In addition, information will
be presented on the Lake ErieNiagara River Ice Boom and
Great Lakes' water levels.

Return to Regulation Plan Flows

As reported last month, in August the International St. Lawrence River Board of Control reduced the outflow from Lake Ontario by 200 cubic metres per second in order to raise levels in sections of the St. Lawrence River. On September 23 the Board resumed discharging higher flows determined according to the regulation plan.

The Board has agreed to a

request by the Ontario Marina Operators Association to have the Lake Ontario outflow set at 200 cubic metres per second below regulation plan flow on October 10-11, and again on October 17-18. This flow adjustment is intended to temporarily raise the level on Lake St. Lawrence in order to help recreational boaters hauling out their boats. At the beginning of October, the level of Lake St. Lawrence was about 45 centimetres below average.

September Outflows From Great Lakes

As a percentage of the long-term September average:

Lake Superior 83% Lake Huron 113% Lake Erie 121% Lake Ontario 119%

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Volume 5, Number 11

November 7, 1997

Dry Weather Over Great Lakes Basin Lake Levels Decline Significantly During October

Levels of all the Great Lakes went down during the month of October. Lakes Huron, St. Clair and Erie declined by more than usual for the month, while Lakes Superior and Ontario declined by an average amount.

Rainfall during October was below average over the Great Lakes basin. This was the sixth month out of the past seven with near average or below average rainfall, and the drier weather has had an impact on lake levels. At the end of October, Lake Ontario's level was 60 centimetres below the peak it reached this year in May, Lake Erie was 50 centimetres below the peak it reached in early June, Lake Huron was 25 centimetres below it's peak of early July, and Lake Superior was over 20 centimetres below it's peak of July. For all of the lakes, these declines are greater than usual over this period.

Despite the decline in levels, Lakes Huron, St. Clair and (continued on next page)

El Niño Could Impact Great Lakes

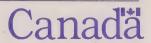
The press is full of stories about the impacts that El Niño may have, or has already had, on our climate. It could also have significant impacts on the Great Lakes.

El Niño occurs when water temperatures in equatorial regions of the Pacific Ocean are above normal, which affects atmospheric patterns and weather in much of the world. This happens every few years, and usually peaks in the late fall and early winter.

Based on past events, it is believed that the Great Lakes area will likely have drier and warmer weather than usual over the next few months. If this should happen, the spring runoff to the Great Lakes would likely be less than average, which could lead to lower lake levels during the spring and summer of 1998.

These conditions could also result in less ice cover over the Great Lakes, which could in turn leave shore areas more exposed to storms and wave action during the winter months.

One study compared storm data from Lake Michigan during previous El Niño years, and found that the strength of storms was greater during those years. That study is suggesting that we could be in for one of the worst storm seasons on record over the Great Lakes. If this is the case, and ice cover is limited, then damage to shore properties could be extensive over the coming months.



Erie were all still about 50 centimetres above average at the end of October. There is a high risk that properties along these lakes could experience extensive damage this fall or winter during a severe storm. Lakes Superior and Ontario were within 10 centimetres of average levels and there is a lower risk of damage to properties along their shores.

Niagara Board Public Meeting

The International Niagara Board of Control held an open house on October 30th in Niagara-onthe-Lake, Ontario. A presentation was made on Board and IJC membership, Board duties, Great Lakes levels, ice conditions in the Maid-of-the-Mist Pool this past spring, upgrading of the Lake Erie - Niagara River Ice Boom and the "twinning" of the Peace Bridge. The Board, its associates and five IJC Commissioners discussed these and other items of interest with the public.

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October Precipitation Over Great Lakes As a percentage of the long-term October average:

Great Lakes Basin, 80% Lake Superior, 109% Lakes Michigan-Huron, 73% Lake Erie, 70% including Lake St. Clair) Lake Ontario, 53%

NOTE: These figures are preliminary

New Regulation Plan Get Mixed Reception

Reception to the new Lake Ontario regulation plan has been mixed, judging by discussions at three public meetings held in Burlington, Kingston, and Dorval.

The IJC's International St. Lawrence River Board of Control has recommended that Plan 35P replace Plan 1958-D in regulating the outflows of Lake Ontario. Plan 35P was initially developed in the Levels Reference Study (1993), and since then has been updated by the Board of Control.

Calls for a more diversified range of levels highlighted the Burlington meeting, home to the wetland area of Cootes Paradise. Scientists there said compression of the range of Lake Ontario levels due to regulation has had negative impacts on the ecosystem of wetlands.

The need to take environmental factors in the St. Lawrence River into consideration was also heard at the Dorval

meeting. In addition, the Board heard concerns of erosion in the river caused by high Lake Ontario outflows, and that large variations in Lake Ontario outflows have negative impacts on navigation and municipal water supplies.

Recreational boaters
everywhere preferred higher
levels and a slower decline in
the levels in the late summer
months. This call was most
evident at the Kingston meeting,
where recreational boating is an
important activity in the
Thousand Islands area of the St.
Lawrence River.

Shore property owners along Lake Ontario and the St. Lawrence River seem to favour the new regulation plan, since it is expected to slightly reduce the frequency of extreme high or low levels on both Lake Ontario and the St. Lawrence River.

Three more public meetings are scheduled in the State of New York in early November. The IJC is expected to render its decision following completion of this series of meetings.

October Outflows From Great Lakes

As a percentage of the long-term October average:

Lake Superior 82% Lake Huron 112% Lake Erie 119% Lake Ontario 121%



Volume 5, Number 12

December 8, 1997

Another Dry Month

Seasonal Decline of Lake Levels Continues

Water levels of all the Great Lakes continued their seasonal decline during November. The magnitude of decline was near average on Lake Superior and

significantly greater than average on the other lakes.

The recent trend of below average precipitation continued over most of the

Great Lakes basin during November. These dry conditions contributed to the relatively rapid decline in lake levels during the month. (continued on next page)

Large Turnouts at Public Meetings on New Lake Ontario Regulation Plan

The very strong turnout at six recent public meetings underscored the public's continued interest in water level fluctuations in the Lake Ontario - St. Lawrence River system. Close to 700 people attended the three meetings in the U.S. organized by the IJC and its International St. Lawrence River Board of Control. Last month we reported on the three meetings in Canada.

At the Brockport and Sodus Point meetings, shore property owners gave a qualified support for the new regulation plan, called Plan 1998. On the other hand, the public in Massena voiced opposition, citing lack of consideration for the local environment. They also criticized the IJC and the Board for the extremely low water levels on Lake St. Lawrence this summer caused by high Lake Ontario outflows.

A common call heard at all the public meetings was that the regulation criteria for Lake Ontario should be updated. The existing criteria, developed in the mid-1950's, are considered outdated and thus no longer reflect the current needs of all the interests affected by water level fluctuations, including the environment and recreational boaters. A study plan has been developed by the Board, but has not been funded by governments.

The information collected at the public meetings is being examined by the IJC in order to reach a decision regarding the new regulation plan. The Board continues to exercise its discretionary authority, when situations arise, to make departures from the regulation plan in order to provide overall benefits to all the interests in the system.



Lake Ontario's basin received more precipitation than other areas, and this contributed to a stabilization of the lake's level during the last part of November.

Despite the decline in lake levels, at the end of November Lakes Huron, St. Clair and Erie were all still 40 to 50 centimetres above average levels for this time of year. These three lakes are now midway between average levels and record high levels. While the decline in water levels has helped to reduce the risk of shore damage, there is still considerable risk of extensive damage along these three lakes if a severe storm should occur.

Fortunately, no severe wind storms have occurred so far this fall. Last month the largest storm surge on Lake Erie was only 60 centimetres

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November Precipitation Over Great Lakes As a percentage of the long-term November average:

Great Lakes Basin, 78% Lake Superior, 86% Lakes Michigan-Huron, 63% Lake Erie, 83% (including Lake St. Clair) Lake Ontario, 109%

NOTE: These figures are preliminary

at Port Colborne near the lake's eastern end, and 50 centimetres at Bar Point, which is at the lake's western end. From historical records, there is a 50 percent chance in a year that a surge greater than 1.3 metres will occur at Port Colborne and greater than 60 centimetres will occur at Bar Point.

A continuation of dry weather would lead to further declines in the levels of all three lakes over the next month.

However, if an average amount of precipitation should occur, then Lakes Erie and St. Clair would only decline marginally. Above average precipitation could also slow the decline of Lake Huron's level.

Despite below average outflow during November, Lake Superior's level declined significantly, primarily due to the dry conditions. At the end of November, the lake was four centimetres above average.

Its level is likely to continue falling for several months, and there is little risk of extensive damage to properties along its shore.

Lake Ontario's level was about 11 centimetres lower in November than the previous month. Its level was stable during the last 10 days of the month, and it was eight centimetres above average at the end of November. While a further decline is possible, rainy weather during the next month could result in a modest increase in the lake's level. The risk of damage to shore properties over the coming months is low.

High St. Lawrence River flows contributed to above average levels on Lac St. Louis near Montréal. During November, the lake's level was about 15 centimetres above average. Meanwhile, levels further downstream at Montréal Harbour were slightly below average during the month.

November Outflows From Great Lakes

As a percentage of the long-term November average:

Lake Superior 79% Lake Huron 111% Lake Erie 119% Lake Ontario 119%



Volume 6, Number 1

January 7, 1998

Dry Weather Continues Over Great Lakes Basin **Water Levels Decline Rapidly on Upper Great Lakes**

Water levels Lakes on Superior, Huron and St. Clair declined quickly during Very December. dry conditions persisted throughout the month, with minimal rainfall and snowfall in most of these areas.

Despite below average outflows from Lake Superior during December, the lake's level declined more than average. The combination of relatively low inflows from Lake Superior into Lake Huron and little precipitation contributed to a much greater than average decline in Huron's level during the month. Meanwhile, the decline in Lake Huron's level and low local inflow resulted in Lake St. Clair's level declining at a time of year when its level is often static. The decrease in water levels on Lakes Huron and St. Clair over the past several months has considerably reduced the risk of severe damages to shore properties in the event of storms prior to the formation

of shorefast ice.

At the end of December, Lake Superior's level was only five cm above average, while Lakes Huron and St. Clair were 38 and 47 cm above average, respectively. Further declines in the levels of Lakes Superior and Huron are likely, but Lake St. Clair may be near the low end of its annual cycle.

The water levels of Lakes Erie and Ontario changed little during December. Both of these lakes are probably at the low end of their annual cycle, although modest further

declines are possible if dry conditions continue. Lake Erie was about 50 cm above average, while Lake Ontario was three cm above average at month's end.

An article in the November Level News expressed concern that severe storms could be associated with El Niño. So far this fall and winter, there has been a noticeable absence of prolonged high wind events over the Great Lakes. The largest storm surge at Port Colborne over the past two months was 60 cm, which is much less than usual.

December Precipitation Over Great Lakes As a percentage of the long-term December average:

Great Lakes Basin, 64% Lake Superior, 50% Lakes Michigan-Huron, 56%

Lake Erie, 98% (including Lake St. Clair) Lake Ontario, 77%

December Outflows From Great Lakes

Lake Superior 87% Lake Huron 111%

Lake Erie 117% Lake Ontario 122%

NIVEAU DES GRANDS LACS ET DU SAINT-LAURENT

info-III/EAU

Volume 6 Numéro 1

Le 7 janvier 1998

Le temps sec se maintient dans le bassin des Grands Lacs Déclin rapide du niveau d'eau du secteur supérieur des Grands Lacs

Le niveau des lacs Supérieur, Huron et Sainte-Claire a baissé rapidement en décembre. Le temps a été très sec pendant tout le mois. En effet, la plupart de ces régions n'ont connu que des précipitations de neige et de pluie minimales.

Même si le débit sortant du lac Supérieur était au-dessous de la normale en décembre, le niveau du lac a baissé plus que la moyenne. Le lac Huron a baissé beaucoup plus que d'habitude durant le mois à cause d'un débit sortant relativement bas du lac Supérieur au lac Huron et peu de précipitations. Pendant ce temps, la baisse du lac Huron et le débit entrant peu élevé ont fait baisser le niveau du lac Sainte-Claire à une période de l'année où son niveau est plutôt stationnaire. La baisse des lacs Huron et Sainte-Claire au cours des derniers mois a considérablement réduit le risque de dégâts graves auxquels sont exposées les propriétés riveraines en cas de tempête avant que ne se forme la glace de rivage.

À la fin de décembre, le niveau du lac Supérieur n'était que 5 centimètres au-dessus de la moyenne, tandis que les niveaux des lacs Huron et Sainte-Claire étaient respectivement 38 cm et 47 cm au-dessus de la moyenne. Il est fort probable que les lacs Huron et Sainte-Claire baissent encore davantage, mais le lac Sainte-Claire pourrait avoir presque achevé sa baisse annuelle.

Les niveaux des lacs Érié et Ontario n'ont que peu changé en décembre. Ces deux lacs ont probablement terminé leur baisse annuelle, quoiqu'ils puissent baisser encore un peu si le temps sec se maintient. Le niveau du lac Érié se situait 50 centimètres au-dessus de la moyenne, tandis que celui du lac Ontario se situait 3 centimètres au-dessus de la moyenne à la fin du mois.

Un article dans le numéro de novembre d'Info-Niveau s'inquiétait du fait que le phénomène atmosphérique El NiZo puisse provoquer de violentes tempêtes. Jusqu'à maintenant, en automne et en hiver, on a noté l'absence de vents forts et prolongés dans le bassin des Grands Lacs. La marée de tempête la plus importante à Port Colborne au cours des deux derniers mois ne faisait que 60 cm, ce qui est bien moins que d'ordinaire.

Grands Lacs - Précipitations en décembre

Pourcentage de la moyenne à long terme pour décembre

Bassin des Grands Lacs, 64% Lac Supérieur, 50% Lacs Michigan et Huron, 56% Lac Érié, 98% (y compris le lac Sainte-Claire) Lac Ontario, 77%

Débits sortants des Grands Lacs - décembre

Lac Supérieur 87%
Lac Érié 117%

Lac Huron 111% Lac Ontario 122%

NOTE: Ces chiffres sont préliminaires.



Volume 6, Number 2

February 4, 1998

Heavy Precipitation Hits Lakes Erie and Ontario **Water Levels Rise Rapidly on Lower Lakes**

After several months of declining water levels, a rapid increase occurred on the lower Great Lakes during January. In contrast to the generally dry conditions experienced during the previous three months,

precipitation was very heavy in January.

Lakes Ontario, Erie and St. Clair all experienced a significant increase in water levels. By far the largest

increase occurred on Lake Ontario. At the end of January, its level was 44 cm higher than at the beginning of the month, and 44 cm above average. Water levels on both (continued on next page)

Difficult Conditions for St. Lawrence River Outflow Regulation

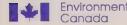
The severe ice storm that struck eastern Canada in early January caused difficulties for operation of the St. Lawrence River flow control structures. These difficulties were compounded by limitations on flow that accompany formation of an ice cover on the St. Lawrence River.

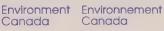
At the peak of the ice storm, there were widespread power outages due to downed power lines and towers. This led the International St. Lawrence River Board of Control to direct large temporary reductions in flows at hydroelectric power plants in the St. Lawrence River.

The damage to transmission lines meant that hydroelectric plants could not deliver as much power as before the storm. As a result, the plants had to reduce power generation. To continue releasing as much water as possible, many turbines not producing electricity were kept running, but at reduced water flow rates. Since there was no resistance on the turbines from generating power, flowing the same water as before would have damaged the equipment. Nearby spillways were opened to partially offset the turbines' flow limitations.

Flow capacity through the spillways at the Beauharnois-Cedars hydroelectric complex near Montreal was not enough to completely offset cutbacks in the turbine flows, and the water level upstream on Lake St. Francis began to rise rapidly. To avoid serious flood conditions on Lake St. Francis, the Board of Control reduced Lake Ontario's outflow at the hydropower plant near Cornwall, beginning on January 8. Until that time, the Lake Ontario outflow was 8,300 cubic metres per second (cms), which was well above average.

The reductions brought Lake Ontario's outflow to as low as 5,500 cms. Gradual increases took place as generating units at Beauharnois-Cedars were returned to service. By January 14, the outflow was at 6,500 cms, which was the maximum possible given ice cover conditions in the Beauharnois Canal. In a typical winter, the lake's outflow is reduced for a short period to about 6,500 cms, to help formation of a strong and smooth ice cover. A good ice cover helps prevent underwater blockages that can restrict flows the rest of the winter. Moderate temperatures slowed formation of a strong ice cover, and the flow was kept at 6,500 cms until the end of January.







Lakes Erie and St. Clair increased about 10 to 15 cm during the month, with Lake Erie's end of January level at 67 cm above average and Lake St. Clair's level 69 cm above average.

The rapid increase in water levels was brought on by very heavy precipitation during January, especially just before and during the severe ice storm that hit the eastern portion of this area. The total supply of water to Lake Ontario (comprised of precipitation on the lake's surface plus runoff from its basin and inflow from Lake Erie) was the highest on record for the month of January.

Concerns about potential damages to shore properties around these three lakes have been heightened with the rise in lake levels. If wet weather

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January Precipitation Over Great Lakes

As a percentage of the long-term January average:

Great Lakes Basin, 150% Lake Superior, 91% Lakes Michigan-Huron, 165% Lake Erie, 166% (including Lake St. Clair) Lake Ontario, 186%

NOTE: These figures are preliminary

continues over the next few months, all of these lakes could be approaching record high levels by late spring, which would make them very susceptible to storm damages. At present, ice cover is protecting the Lake St. Clair shoreline, but it is almost totally absent from the shores of the other lakes.

In contrast to the lower lakes, water levels on Lakes Superior and Huron declined by close to average amounts during January. At the end of the month, Lake Superior was 4 cm above average while Lake Huron was 41 cm above average. It is very unlikely that either of these lakes will approach their respective record highs through the spring.

The risk of storm damages to shore properties over the next few months is low for Lake Superior and is moderate for Lake Huron.

Deadline Extended

The International Joint
Commission has decided to
extend the deadline for written
comment on a proposed
regulation plan for Lake
Ontario outflows that would
make minor adjustments to the
regulation of water levels on
the lake and St. Lawrence
River as far downstream as
Trois Rivières, Quebec.

The Commission will consider written comments received by March 2, 1998 at:

International Joint
Commission
100 Metcalfe Street,
18th Floor
Ottawa, ON K1P 5M1
Fax (613) 993-5583
Email Clamenm@achilles.net

For more information, contact Garwood Tripp at (613) 995-0088.

January Outflows From the Great Lakes As a percentage of the long-term January average:

Lake Superior 94% Lake Huron 123% Lake Erie 127% Lake Ontario 109%



Volume 6, Number 3

March 5, 1998

Snowmelt Starts Early

Levels Remain High on Lower Lakes

The water levels of Lakes St. Clair, Erie and Ontario remained 45 - 70 centimetres above average during February. Very mild temperatures during February over this area led to an early onset of snowmelt, which contributed to a larger than usual monthly rise in the levels of Lakes Erie and Ontario.

At the end of February, Lakes St. Clair and Erie were both about 70 cm above average, while Lake Ontario was 50 cm above average. Lake Erie's February level was the highest since 1987, while Lake Ontario's was the highest since 1993. Lake St. Clair's level was slightly lower than that of February 1997.

Levels on both Lakes Huron and Superior declined by an average amount during February. At the end of February they were 38 and 5 cm above average, respectively.

If very wet conditions should occur over the next several months, Lakes St. Clair and (continued on next page)

Lake Ontario's Outflow Increased

After severe limitations on Lake Ontario's outflow during January due to complications arising from the ice storm and the formation of an ice cover on the St. Lawrence River, improved conditions during February permitted a higher outflow. The outflow was increased steadily from 5,500 cubic metres per second (cms) on January 9 to as high as 9,400 cms towards the end of February. The total outflow during February was only slightly less than the record high set last year for the month.

It is anticipated that the March outflow will also be very high. The breakup of ice cover on the St. Lawrence River can limit flows at this time of the year, but the river's ice has almost completely dissipated. However, depending on the timing and magnitude of the Ottawa River freshet, it may be necessary at some point to reduce the Lake Ontario outflow to prevent serious flooding on Lake St. Louis and below Montréal.

The International Joint Commission has invoked criterion (k) of its Orders of Approval for Lake Ontario-St. Lawrence River regulation. Criterion (k) gives precedence to shoreline property owners on Lake Ontario and the St. Lawrence River when setting the lake's outflow. In practice, this means that the outflow is being maximized without causing significant flood and erosion problems to property owners along the St. Lawrence River.

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Erie could rise to very close to record high levels, and Lake Ontario could rise to within 20 cm of its record high. However, there is reason for some optimism that this might not occur, as there is much less snow than usual left to melt on the ground, which should result in lower runoff.

There continues to be a very high risk of flood and storm damage along the shores of Lakes St. Clair, Erie and Ontario, especially during the next two months when storms can be severe. The risk is moderate for Lake Huron's shore, and low for Lake Superior's shore.

Dry Winter Over Lake Superior Basin

The winter months from December to February have been a very dry period over

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Aussi disponible en français .

February Precipitation Over Great Lakes As a percentage of the long-term February average:

Great Lakes Basin, 76% Lake Superior, 63% Lakes Michigan-Huron, 70% Lake Erie, 111% including Lake St. Clair) Lake Ontario, 92%

NOTE: These figures are preliminary

Lake Superior's basin. The water equivalent of the average total snowfall and rainfall over the basin is 13.8 cm. However, this winter the total has only been 9.4 cm, or 68% of average.

The dry conditions have led to below average amounts of snow on the ground. As a result, it is likely that runoff to Lake Superior this spring will be less than average, which could result in a relatively small increase in the lake's level during the spring. The outflow from Lake Superior to Lake Huron has been below average since last September, and a small spring runoff could result in a continuation of low outflows over the next several months. This would provide some relief to the high water levels on the other lakes.

Where's the Ice?

One of the many impacts of the mild winter has been an almost total lack of ice on the Great Lakes. By the end of February the only area with significant ice cover was the North Channel of Lake Huron. Lake Superior did have some ice cover earlier in the winter, but by month's end it was mainly confined to a few bays. For the first time since 1983, Lake Erie had virtually no ice the entire winter.

The absence of ice has increased the risk of damage to shore properties due to waves and flooding. The usual build-up of ice prevents waves from striking the shoreline, and it also reduces the amount of short-term surge in water levels that occurs when strong winds blow across a lake. This natural form of protection is absent this year.

February Outflows From Great Lakes As a percentage of the long-term February average:

Lake Superior 94% Lake Huron 124%

Lake Erie 128% Lake Ontario 128%





Volume 6, Number 4

Heavy Rain Over Great Lakes Basin **Lake Levels Climb**

Heavy rainfall over much of the Great Lakes basin, especially during the last week of March, pushed up water levels on the Great Lakes and increased the risk of flood and erosion damages to shore properties.

While dry weather extended over all of the basin during the first week of the month, heavy precipitation occurred over the basins of Lakes

Ontario, Erie and Michigan-Huron during the second and third weeks, and very heavy rainfall fell over the basins of Lakes Michigan-Huron and Superior during the last week (continued on next page)

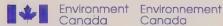
Record High Outflow from Lake Ontario During March

Outflow from Lake Ontario during March set a new record high for the month, eclipsing the previous record set in March 1997. During the past month, the flow averaged 9430 cubic metres per second (cms), while the previous record was 9130 cms.

The outflow during March is often limited by concerns that high flows could cause ice jams in the river. However, due to the mild winter there was virtually no ice in the river upstream of Montreal by the beginning of this March, and there was no potential for a jam to form. This allowed the International St. Lawrence River Board of Control to permit flow in excess of 10,000 cms for much of the month. The very high outflow contributed to a less than average increase in Lake Ontario's water level during the month, despite above average rainfall and very high inflow from Lake Erie.

However, the Board found it necessary to sharply curtail outflow during the last four days of March. The combination of record mild temperatures and rainfall led to rapid snowmelt and runoff into the Chateauguay River, the Ottawa River, and other tributaries that empty into Lake St. Louis, which is a widening of the St. Lawrence River upstream of Montreal. As Lake St. Louis' level started to climb, the inflow to the lake through the St. Lawrence River was reduced through a series of reductions in Lake Ontario's outflow. Despite these outflow reductions, Lake St. Louis rose above flood stage on March 29. By March 31, Lake Ontario's outflow was further reduced to 4,700 cms.

It is likely that high inflows to Lake St. Louis from local tributaries will subside during the first few days of April and some increase in Lake Ontario's outflow will be possible. However, high flow from the Ottawa River to Lake St. Louis may continue for several days, which will limit the amount of increase possible in Lake Ontario's outflow over the short term. On April 6, the outflow was 5,500 cms.







of March. During the first three months of 1998, Lake Superior's basin has received about an average amount of precipitation, but all of the other lake basins have received about thirty percent above their average.

At the end of March, Lake Ontario was about 47 centimetres above average, Lake Erie was 67 centimetres above average and Lake St. Clair was 59 centimetres above average. Lake Huron was about 44 centimetres above average and Lake Superior was 5 centimetres above average.

If wet conditions should persist over the next several months, Lake Ontario's level could exceed last year's peak by up to 25 centimetres, and levels on Lakes Erie, St. Clair and Huron could match those of last year. If average amounts of rainfall occur,

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March Precipitation Over Great Lakes As a percentage of the long-term March average:

Great Lakes Basin, 175% Lake Superior, 144% Lakes Michigan-Huron, 214% *Record high

Lake Erie, 141% including Lake St. Clair) Lake Ontario, 127%

NOTE: These figures are preliminary

Lake Ontario's peak level will be close to that of last year. and the other lakes will remain below the levels of one year ago.

The risk of damage to shore properties along Lakes Ontario, Erie and St. Clair is very high, especially during periods of strong onshore winds. There is a moderate risk of damage along the shore of Lake Huron, including Georgian Bay, and low risk along Lake Superior.

Discover the Great Lakes

Environment Canada has prepared a CD-ROM, titled Discover the Great Lakes, of facts and figures on ecosystems, human activities, toxic chemicals, endangered species, sustainability, climate change, and other environmental topics relating to the Great Lakes-St. Lawrence basin. For further information, see: http://www.cciw.ca/glimr/great-

lakes-cd-rom/ or call 1-800-661-7785.

The CD is available at a retail price of \$39.95 or an educational price of \$19.95 plus shipping and taxes, and may be ordered by calling 1-888-321-2563.

Lake Erie Ice Boom Removed

The ice boom at the mouth of Lake Erie was removed on March 5th, which was the earliest on record. Virtually no ice formed behind the. boom this winter due to the very mild conditions.

March Outflows From Great Lakes

As a percentage of the long-term March average:

Lake Superior 104% Lake Huron 112%

Lake Erie 131% Lake Ontario 141%



Volume 6, Number 5

May 5, 1998

Problems Continue on Lower Lakes High Water Levels Moving Down Through Basin

The high water levels that have troubled the Great Lakes since 1996 are showing some signs of working their way through the lakes and out the St. Lawrence River. While it is still much too early to say that the worst is over, there

has been definite signs of improvement in the upper portions of the Basin. At the end of April, Lake Superior's level was within one centimetre (cm) of average and 25 cm lower than one year earlier, while Lake

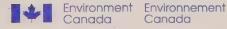
Huron was 10 cm lower than a year ago. As a result of the decline, the planned May outflow from Lake Superior is only 69 percent of last May's outflow. Unless heavy rainfall is received over the (continued on next page)

Lake Ontario's Level Rises to an Early Peak Montreal Area Flooding Kept to a Minimum

A drastic reduction in Lake Ontario outflow kept flooding along the St. Lawrence River in the Montreal area to a minimum during late March and early April. Rapid snowmelt and spring rains led to very high inflows into the St. Lawrence River from the Ottawa River and other tributaries, and pushed water levels around Montreal to flood levels. In an effort to partially offset these high inflows, the discharge from Lake Ontario was reduced to as low as 4700 cubic metres per second for the first five days of April. Fortunately the high discharges from the Ottawa and other tributaries were of relatively short duration. As these flows subsided, the outflow from Lake Ontario was steadily increased as much as possible while maintaining Lac St. Louis' level at or slightly below its critical flood level. A total of 16 flow increases were made during the month, and the outflow at month's end was 9900 cubic metres per second.

Lake Ontario's level increased rapidly during the period of reduced outflow, as expected. However, this rise in lake level slowed and then stopped as the lake's outflow increased. The combination of high outflows and dry weather during the last ten days of April led to a small decline in level at the end of the month. Overall, the increase in the lake's level from the beginning to the end of the month was average.

It appears that Lake Ontario's level has reached its peak for this year, although very heavy rainfall could push it up slightly. The peak level does not usually occur until late May or June, but the early snowmelt this year, and the high outflow from Lake Ontario anticipated for May. has moved it ahead by about a month.







next several months, this lower outflow should result in a further reduction in Lake Huron's level compared to last year.

While the decline in levels on Lakes Superior and Huron gives cause for optimism for the future, levels are presently higher than one year ago on the lower lakes: 5 cm higher on St. Clair, 10 cm higher on Erie, and 18 cm higher on Ontario. This has increased the risk of damages to shore properties on these lakes compared to last spring. If average amounts of precipitation are received, all three lakes should be below last year's level by June, but wet weather could keep these lakes close to last year's level through the summer.

St. Lawrence River flows will be significantly above average through the remainder of spring and into the summer.

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Aussi disponible en français

April Precipitation Over Great Lakes

As a percentage of the long-term April average:

Great Lakes Basin, 80% Lake Superior, 55% Lakes Michigan-Huron, 76% Lake Erie, 135% (including Lake St. Clair) Lake Ontario, 67%

NOTE: These figures are preliminary

Last May it was necessary to reduce the Lake Ontario discharge for a few days to accommodate high Ottawa River flows brought on by snowmelt. This action will not be necessary this month, as all the snow has melted.

Essex County Hit by Storm

The Lake Erie shoreline of Essex County suffered extensive damage during a storm on April 9. Strong easterly winds that day caused a surge in water levels of 76 centimetres at Bar Point and 54 centimetres at Kingsville. Heavy waves driven by the strong wind pounded the shoreline, causing an estimated \$5 million in damages. About 100 homes and cottages were damaged during the storm.

The hardest hit area was Mersea Township between Wheatley and Point Pelee National Park. About 15 homes were damaged to the point of being uninhabitable, and the dyke at Hillman Marsh that protects agricultural and residential land from flooding was also damaged. It was necessary for several homes in the area to be evacuated, and road access was cut off at some locations due to flooding and deposition of sand.

Public Meetings Scheduled

The International St. Lawrence River Board of Control is holding a public meeting on June 16 at 7:00 p.m. at the Sackets Harbor Central School, 215 South Broad Street in Sackets Harbor, Néw York.

The International Lake Superior Board of Control is holding a public meeting on June 23 in South Haven, Michigan. The location has not yet been determined.

April Outflows From Great Lakes

As a percentage of the long-term April average:

Lake Superior 99% Lake Huron 110% Lake Erie 127% Lake Ontario 114%



Volume 6, Number 6

June 5, 1998

Dry Weather Throughout Great Lakes Basin **Risk of Shore Damage Eases**

A decline in water levels on several of the Great Lakes during May has helped to ease somewhat the risk of serious flood and erosion damages to shore properties.

May is usually a time when spring showers combine with high flows from inland lakes and rivers to rapidly increase water levels on the Great Lakes. However, this May was the second dry month in

a row, and snowmelt occurred much earlier than usual this year, with the result that flows into the Great Lakes were well below average during the month.

While water levels usually rise by 5 to 10 centimetres during May, this year there was little change from the previous month's level for Lakes Superior, Huron, St. Clair and Erie. During the

last part of the month, levels on Lakes St. Clair and Erie began to decline steadily. These two lakes may have reached their peak level for the year in early May, which is over a month earlier than usual.

By the end of May, all of the Great Lakes were lower than one year earlier. Lake Superior was 8 centimetres (continued on next page)

Lake Ontario's Level Declines Rapidly

Dry conditions during May, combined with a very high outflow from Lake Ontario, led to a rapid decline in the lake's level. At the end of May the lake's level was 16 centimetres lower than at the beginning of the month, but still 21 centimetres above average. It is anticipated that it's level will continue to decline for the next several months.

Due to the early snowmelt this year and dry conditions, flows from the Ottawa River to the St. Lawrence River in late May were only 36 percent of average. As a result, water levels on Lac St. Louis around Montreal have declined to about 15 centimetres above average.

The decrease in water levels on Lake Ontario and the St. Lawrence River has greatly reduced the risk of damage to shore properties in these areas.



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below average, while Lakes Huron, St. Clair and Erie were 35, 45, and 50 centimetres, respectively, above average.

As a result of the below average level on Lake Superior and above average level on Lake Huron, Lake Superior's outflow during June has been reduced to 81 percent of average, in accordance with the lake's regulation plan.

Despite the decline in lake levels, there is still a moderate risk of flood and erosion damage to shore properties along Lakes Erie and St. Clair this summer during extended periods of strong winds.

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May Precipitation Over Great Lakes

As a percentage of the long-term May average:

Great Lakes Basin, 72% Lake Superior, 62% Lakes Michigan-Huron, 75% Lake Erie, 70% (including Lake St. Clair) Lake Ontario, 82%

NOTE: These figures are preliminary

Low Levels on Lake St. Lawrence

Lake St. Lawrence is the section of the St. Lawrence River immediately upstream of the control structure at Cornwall. Water levels in this area are strongly related to flows in the river. High flows through the control structure cause the level of Lake St. Lawrence to decline. while low flows cause it to rise. The lake's level also tends to move in the same direction as the level of Lake Ontario. During May, the combination of high flows and a declining Lake Ontario level led to a drop in Lake St. Lawrence's level. In late May it was about 60 centimetres below average and near its record low. It is anticipated that flows will remain high in June and Lake Ontario's level will continue to decline, which will lead to

a further decline in Lake St. Lawrence's level. The level in June could approach the minimum on record for the month, which was 72.98 metres and occurred in 1987.

Public Meetings Scheduled

The International St.
Lawrence River Board of
Control is holding a public
meeting on June 16 at 7:00
p.m. at the Sackets Harbor
Central School, 215 South
Broad Street in Sackets
Harbor, New York.

The International Lake Superior Board of Control is holding a public meeting on June 23 from 7:30 p.m. to 9:00 p.m. at the City Council Chambers, South Haven City Hall, 539 Phoenix Street, South Haven, Michigan.

May Outflows From Great Lakes

As a percentage of the long-term May average:

Lake Superior 96% Lake Huron 106% Lake Erie 119% Lake Ontario 131%



CAI MT160 -G64 EIDEMS

Volume 6, Number 7

July 6, 1998

Risk of Shore Damage Continues to Decline Water Levels Move Closer to Average

Levels on all of the Great Lakes except Superior moved closer to their average during June, for the second month in a row. While heavy rainfall. was experienced in many areas late in June, dry weather during much of the month, combined with the residual effect of dry conditions during May, caused levels to remain static or decline at a time when they are usually still rising. All of the lakes are significantly below their levels of one year ago.

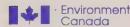
Lakes Ontario and Erie both experienced a decline in levels of about eight centimetres from the beginning of June to the end of the month. On average, these lakes would usually experience minimal change in levels over this period. High outflows from both lakes and below average rainfall over Lake Erie's basin contributed to the decline in levels. As a result, Lake Ontario was 16 cm above average at the beginning of July, while Lake Erie was 41 cm above

average.

Lakes St. Clair and Huron experienced little change in their levels from the beginning to the end of June. In fact, Lake Huron has had almost no change in its level since early April. At the beginning of July, the two lakes were 41 cm and 30 cm, respectively, above average. Lake Superior was the only one of the Great Lakes to experience a near average increase in its level during (continued on next page)

St. Lawrence Board Public Meeting Draws Large Crowd

The International St. Lawrence River Board of Control heard calls to both increase and decrease the outflows from Lake Ontario at its public meeting in Sackets Harbor, New York on June 16th. Many shoreline property owners from Lake Ontario voiced complaints that, in spite of the very high outflows from the lake, the level of Lake Ontario rose too high this spring and led to damage to their properties. Those who live and boat downstream on the St. Lawrence River expressed dissatisfaction with the low water levels in parts of the river that were a result of the high flows, and asked that more consideration be given to their needs. The Board explained that both of these conditions stem from the unusually large volumes of water flowing into and through Lake Ontario this past winter and spring due to the combination of high runoff within its own drainage basin and continued high flows from Lake Erie. About 150 people attended the Sackets Harbor meeting.







June. At the beginning of July it was eight centimetres below average. The outflow from Lake Superior during July will remain at 1780 cubic metres per second, which is the same as the outflow during June.

During June, Lake Ontario's level was 12 cm lower than during June 1997, while the other lakes were all between 23 cm and 26 cm lower than one year ago. This reduction in levels has reduced the risk of damages to shore properties during storms. If no more than average rainfall occurs over the Great Lakes basin over the next several months, lake levels should. continue to steadily decline. By this fall, significant shore damages would likely occur only if unusually severe wind storms hit the lakes.

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Aussi disponible en français

June Precipitation Over Great Lakes

As a percentage of the long-term June average:

Great Lakes Basin, 107% Lake Superior, 108% Lakes Michigan-Huron, 107% Lake Erie, 72% (including Lake St. Clair) Lake Ontario, 146%

NOTE: These figures are preliminary

Lake Superior Board Public Meeting

On June 23rd the International Lake Superior Board of Control held its annual meeting with the public in South Haven, Michigan. An overflow crowd of about 140 attended the meeting, held for the first time by this Board on the shores of Lake Michigan. Most of those in attendance were owners of shoreline property with concerns about shoreline erosion. Dr. Rob Nairn, an independent authority on shore erosion processes, described how wind generated waves were the cause of shore erosion and determined long-term erosion rates. He explained that for eroding bluff type shores, a change in lake level would only cause a change in the elevation where the waves erode the shore. As a result, a lowering of water

levels would only delay the recession of a bluff temporarily while the waves removed the soil at a lower elevation. Eventually, depending on the make up of the soil and amount of wave action, the waves would again reach the foot of the bluff and it would continue to recede. This viewpoint was not well received by many of the shoreline property owners in attendance.

The Lake Superior Board reviewed the current lake level conditions and answered questions about the limitations of regulating Lake Superior outflows to try to balance the levels of Lakes Superior and Michigan-Huron. The audience asked the Board to investigate ways that might lead to lowering the levels of all the Great Lakes.

June Outflows From Great Lakes

As a percentage of the long-term June average:

Lake Superior 81% Lake Huron 105% Lake Erie 114% Lake Ontario 119%

Volume 6, Number 8

August 6, 1998

Water Levels on All Lakes Decline Risk of Shore Damage Continues to Ease

The risk of serious flood and erosion damages to shore properties on the Great Lakes continues to ease, as water levels on all the lakes declined during July. Water levels are expected to continue to decline over the next few months under average weather conditions. All of the lakes are significantly below their levels of one year ago.

Dry conditions over Lakes Superior and Michigan-Huron throughout July caused levels on these lakes to decline at a time when they are usually still rising. After experiencing a near average increase in its level in June. Lake Superior fell 3 cm during July. At the beginning of August, the lake was 16 cm below average.

After experiencing virtually no change in its level since April, Lake Huron fell 9 cm during the month. Lake Huron was 20 cm above average at the beginning of August. Both lakes may have reached their seasonal peaks during July.

While heavy rainfall was experienced over Lakes St. Clair, Erie and Ontario early in the month, dry conditions during much of the month allowed these lakes to continue their steady decline which began in April or May. Lakes St. Clair and Erie both experienced a decline of about 9 cm from the beginning of July to the end of the month, while Lake Ontario fell 15 cm over the same period. As a result, at the beginning of August,

Lakes St. Clair, Erie and Ontario were 35 cm. 36 cm and 9 cm above average. respectively.

Lake St. Lawrence levels were well below seasonal average in July, due to high flows at the hydropower dam at Cornwall, Ontario. Water levels in this part of the St. Lawrence River are expected to continue to decline slowly for the rest of the year.

Below Cornwall, the levels on Lake St. Francis and Lake St. Louis were generally higher than average in July, due mainly to the high flows from Lake Ontario. Montreal levels last month were near the post-1967 average value.



Accessing Water Level Data by Telephone

Present water levels on the Great Lakes and St. Lawrence River are available from a network of gauging stations operated by the Canadian Hydrographic Service. Phone numbers for the stations are listed below. When you call a particular station, the answering equipment will ask you to press 1 for English or 2 for French, on the keypad of your touch-tone phone. If you do not have a touch-tone phone, the message will start after a few seconds delay. The present water level is given in metres relative to chart datum at that station. Next the message gives the high and low water levels recorded during the previous 12 hours, followed by the elevation of chart datum. You can press 1 or 2 at any time during the message to have it start again, or press 0 to end the call. Call (905) 336-4844 (Fax 905-336-8916 or chs@cciw.ca) to report any problems or to obtain additional information.

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July Precipitation Over Great Lakes As a percentage of the long-term July average:

Great Lakes Basin, 74% Lake Superior, 77% Lakes Michigan-Huron, 53% Lake Erie, 107% (including Lake St. Clair) Lake Ontario, 106%

NOTE: These figures are preliminary

Lake Superior	at Thunder Bay	(807) 344-3141
	at Rossport	(807) 824-2250
	at Michipicoten	(705) 949-1886
	at Gros Cap	(705) 779-2052
St. Marys River	above the lock	(705) 949-2066
	below the lock	(705) 254-7989
North Channel	at Thessalon	(705) 842-2215
	at Little Current	(705) 368-3695
Georgian Bay	at Parry Sound	(705) 746-6544
	at Collingwood	(705) 445-8737
Lake Huron	at Tobermory	(519) 596-2085
	at Goderich	(519) 524-8058
St. Clair River	at Point Edward	(519) 344-0263
	at Port Lambton	(519) 67-7-4092
Lake St. Clair	at Belle River	(519) 728-2882
Detroit River	at Amherstburg	(519) 736-4357
Lake Erie	at Bar Point	(519) 736-7488
	at Kingsville	(519) 733-4417
	at Erieau	(519) 676-1915
	at Port Stanley	(519) 782-3866
	at Port Dover	(519) 583-2259
	at Port Colborne	(905) 835-2501
Lake Ontario	at Port Weller	(905) 646-9568
	at Burlington	(905) 544-5610
	at Toronto	(416) 868-6026
	at Cobourg	(905) 372-6214
	at Kingston	(613) 544-9264
St. Lawrence Rive		(613) 345-0095
	at Iroquois above lock	(613) 652-4426
	at Iroquois below lock	(613) 652-4839
	at Morrisburg	(613) 543-3361
	at Cornwall	(613) 930-9373
	at Summerstown	(613) 931-2089
		() / 200)

July Outflows From Great Lakes As a percentage of the long-term July average:

l ake Superior 799/

Lake Superior 78% Lake Huron 103% Lake Erie 116% Lake Ontario 119%



Volume 6, Number 9

September 4, 1998

Large Decrease Since Last Year Lake Levels Continue to Decline

All of the Great Lakes experienced a larger than usual decline in water levels during August, continuing the trend of the past several months. As a result of the decline in levels, Lakes Superior, Huron, St. Clair and Erie were about 25 to 35

centimetres lower then they were in August 1997, while Lake Ontario was eight cm lower this August.

Dry conditions for the second consecutive month led to the above average declines during August in the levels of Lakes Superior and Huron. While it was somewhat wetter over the drainage basins of Lakes Erie and Ontario, above average outflows from these lakes contributed to their decline. Also, it is likely that the (continued on next page)

Lake Ontario Outflows Reduced

In order to provide relief from near-record low water levels on Lake St. Lawrence, the International St. Lawrence River Board of Control has temporarily reduced Lake Ontario outflows by approximately two percent below the flow called for by the regulation plan.

During the three-week period from August 20 to September 9, Lake Ontario's outflow was reduced to 200 cubic metres per second less than the outflow called for by the regulation plan. From September 10 through October 9, the outflow will be the amount called for by the regulation plan. The flow reduction of 200 cubic metres per second will resume for three days from October 10-12.

Beginning October 15, the outflow will be increased to an amount greater than that called for by the regulation plan, in order to discharge the water held back during the preceding weeks. It is the Board's intention to discharge all this water before the end of the navigation season, if possible. However, a minimum water level of 72.6 metres will be maintained at Long Sault to promote safe navigation, which may limit the ability to quickly discharge this water.

The Board's strategy is intended to provide a measure of relief to riparians and recreational boaters in the Lake St. Lawrence area. It will provide up to 10 centimetres of water level increase on Lake St. Lawrence and temporarily raise the level of Lake Ontario up to three centimetres. Prior to this initiative, Lake St. Lawrence was about 70 centimetres below average.

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warm air temperatures we have experienced over the spring and summer have led to high rates of evaporation from the lakes and the surrounding land.

At the beginning of September, Lake Superior was 21 cm below its average level. Lakes Huron, St. Clair and Erie were 17, 33, and 35 cm, respectively above their average level, while Lake Ontario was four cm above average.

It is expected that levels of all the lakes will continue to decline through the autumn months. As a result of these lower levels, the risk of damage to shore property is much lower this fall than it was last year. However, despite this improvement, there is still a moderate risk of damage to properties along Lake Erie in the event of severe fall storms.

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August Precipitation Over Great Lakes As a percentage of the long-term August average:

Great Lakes Basin, 92% Lake Superior, 84% Lakes Michigan-Huron, 86% Lake Erie, 106% (including Lake St. Clair) Lake Ontario, 119%

NOTE: These figures are preliminary

Low Level on Lake Superior

The average water level of Lake Superior this August was 183.38 metres, which was 19 cm below the long term average August level. The record low level for August was set in 1926, and since then there has only been one August (1990) with a level lower than this year's.

The decline in Lake
Superior's level over the past
year has led to a large
decrease in the lake's
outflow. During this August,
the outflow was just over
one-half of the outflow
during August 1997. Despite
this decrease in outflow, dry
conditions have led to an
unusual decline in the lake's
level at a time of year when it
would typically be rising.

Open House Scheduled

The International Niagara Board of Control is holding an open house on October 20 at 7:30 p.m. at the Hyatt Regency Buffalo, Two Fountain Plaza, Buffalo, New York (Tel. 716-856-1234).

The purpose of this open house is to inform the public of the Board's current activities and to hear public comments and suggestions regarding the Board's work. In addition, information will be presented on Great Lakes' water levels, Ontario Hydro's proposed new diversion tunnel and the twinning of the Peace Bridge.

August Outflows From Great Lakes

As a percentage of the long-term August average:

Lake Superior 67%
Lake Huron 101%

Lake Erie 112% Lake Ontario 116%



Volume 6, Number 10

October 5, 1998

Dry Weather Over Great Lakes Basin Rapid Decrease in Lake Levels During September

Dry, warm weather over most of the Great Lakes basin during September contributed to an above average decline in lake levels during the month. This decline brought levels of all of the Great Lakes to within 30 centimetres of their average levels for the first time since June 1996.

For the third consecutive month. rainfall was below average over the drainage basins of Lakes Superior, Michigan and Huron. Over these three months, Lake Superior's level has declined by 15 cm and Lake Huron's level has decreased by 30 cm. By comparison, during the same three-month period in 1996, which was a period of nearly

average rainfall, Lake. Superior's level went up about 10 cm and Lake Huron's level did not change.

As a result of the unusual decline in Lake Superior's level, it was at its lowest September level since 1926. At the beginning of October, Lake Superior was 26 cm below (continued on next page)

Lake St. Lawrence Water Levels Improved in September

Water levels on Lake St. Lawrence rose slightly in September, much to the relief of some recreational boaters in that part of the St. Lawrence River immediately upstream of Cornwall, Ontario. In our previous issue, we reported on the low water level problems faced by boaters due to declining Lake Ontario water levels and high flows at Cornwall's hydropower dam.

Several factors acted in the boaters favour. First, there was a slight reduction in the Lake Ontario outflow, during the period August 20 - September 9, that was directed by the International St. Lawrence River Board of Control. Secondly, the Lake St. Lawrence area got a considerable amount of rain, which increased the flows of the local tributaries. Lastly, easterly winds, which can aggravate the low water level conditions on Lake St. Lawrence, were noticeably absent.

During the three week period when the Lake Ontario outflow was reduced, the levels on Lake St. Lawrence averaged at elevation 72.88 m. While this was still 40 cm below average, it was much better than earlier in the summer when levels were as much as 70 cm below average.

The water level of Lake St. Lawrence is expected to continue to decline the rest of this year. During Thanksgiving weekend (October 10-12), the Lake Ontario outflow will again be reduced by a small amount (about 2 ½%) in order to temporarily raise the water level on Lake St. Lawrence, for the purpose of helping marinas to take their boats out of the water. The flow reduction should bring a very slight improvement in the water levels at that time. But boaters are advised that weather conditions, in terms of winds or rain, may not be as favourable this time around

average, while Lake Huron was

10 cm above average.

The dry conditions spread into the basins of the lower Great Lakes as well during September. During the previous two months this area had received a slightly above average amount of precipitation. With the drier and warm conditions in September, Lakes St. Clair, Erie and Ontario all declined by more than their average amounts. At the beginning of October, Lake St. Clair was 23 cm above average, Lake Erie was also 23 cm above average, and Lake Ontario was six cm below average. This marks the first time that Lake Ontario's level has been below average since April 1996.

Open House Scheduled

The International Niagara Board of Control is holding an open house on October 20 at 7:30 p.m. at the Hyatt Regency Buffalo, Two Fountain Plaza, Buffalo, New York (Tel. 716-856-1234).

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September Precipitation Over Great Lakes

As a percentage of the long-term September average:

Great Lakes Basin, 91% Lake Superior, 99% Lakes Michigan-Huron, 99% Lake Erie, 57% (including Lake St. Clair) Lake Ontario, 75%

NOTE: These figures are preliminary

The purpose of this open house is to inform the public of the Board's current activities and to hear public comments and suggestions regarding the Board's work. In addition, information will be presented on Great Lakes' water levels, Ontario Hydro's proposed new diversion tunnel and the twinning of the Peace Bridge.

Why Have Lake Levels Gone Down so Much?

As the decline in lake levels has picked up speed over the past few months, this is a question we have been hearing more and more. Regardless of whether people view this decline as positive or negative (and we hear both viewpoints), the magnitude of the decline over the summer has surprised many.

Surprisingly, precipitation over the whole Great Lakes basin from January to August this year was only 1% below normal. However, the rainfall has not been uniformly distributed over the basin -- Lake Superior's basin have been much drier than average, while Lake Ontario's basin has been wetter than average.

Furthermore, much of this year's precipitation occurred during the winter months, with progressively drier conditions during the spring and summer. So below average rainfall has been one factor, particularly for Lake Superior and to a lesser extent on the other lakes over the past six months.

A second factor that has probably had an equal or greater impact has been the above average temperatures over the past several months. Warm temperatures increase the amount of water used by vegetation and transpired to the air. Evaporation from the land and the lakes' surfaces is also higher during warm periods. As a result, runoff from rivers to the lakes has been very low since spring.

Lake Ontario's level has also been influenced by the regulation of its outflow. During most of the spring and summer the lake's outflow has been much above average (and also above what it would have been if regulation had not been implemented) which has contributed to its rapid decline.

September Outflows From Great Lakes

As a percentage of the long-term September average:

Lake Superior 66%
Lake Huron 100%

Lake Erie 110% Lake Ontario 114%



Volume 6, Number 1

November 5, 1998

Dry Conditions Persist

Rapid Descent in Lake Levels Continues

Water levels on all of the Great Lakes continued to decline rapidly during October. Dry weather and warm temperatures led to below average runoff, and also caused above average evaporation.

For the seventh consecutive month, net basin supplies to both Lake Superior and Lakes Michigan-Huron were below average. The net basin supply consists of the combination of rain that falls directly on the lake plus

runoff that enters the lake from the surrounding basin minus evaporation from the lake's surface. In the case of Lake Superior, the net basin supply has been below average during 16 of the past 18 (continued on next page)

Low Water Levels at Montreal

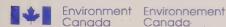
Very low flows of the Ottawa River in October led to low water level conditions at Montreal Harbour. Last month's level was about one-half metre below average, and only 12 cm above the October record low experienced over the past 32 years. By month end, the harbour's level was very close to chart datum.

While the flows from Lake Ontario last month were more than average, the amount has been gradually reduced due to the fast decline of Lake Ontario's water levels.

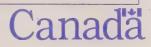
To ensure levels remain above chart datum at Montreal, the International St. Lawrence River Board of Control authorized short-term increases in the Lake Ontario outflow on two occasions last month. The Board has also authorized further limited outflow increases should the need to maintain chart datum at Montreal arise.

As mentioned in the September Level News, the outflow from Lake Ontario was reduced slightly for a three week period in August and September, and again for three days in October to help marina operators in hauling out their boats on Lake St. Lawrence. The effect of this deviation from the regulation plan was to raise Lake Ontario's level by three centimetres. The intention was to increase the outflow above that called for by the regulation plan between mid-October and late December in order to discharge the three centimetres.

When mid-October arrived, Lake Ontario's level had fallen to below average, and the International St. Lawrence Board of Control agreed to defer beginning the discharge of the three centimetres. This water will probably be discharged over the next few weeks in order to help keep the water level at Montreal Harbour near chart datum for as long as possible. However, it is quite probable that the harbour's level will drop below chart datum over the coming weeks.







months. This extended period of below average water supplies to these lakes has driven the decline in their levels.

At the beginning of November, Lake Superior was 29 cm below average level, and only four cm above chart datum. Lake Huron was two cm above average level.

The water levels of Lakes St. Clair and Erie have also been declining quickly, in part due to the weather conditions and also due to reduced inflow from Lake Huron. These two lakes are now 18 cm above their average levels. The risk of extensive flood and storm damage along the shores of these lakes has decreased considerably with the decline in water levels.

During October, Lake Ontario's level declined at the fastest rate of any of the Great Lakes. At the beginning of November, its level was 17 cm below average.

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October Precipitation Over Great Lakes

As a percentage of the long-term October average:

Great Lakes Basin, 99% Lake Superior, 136% Lakes Michigan-Huron, 95% Lake Erie, 75% (including Lake St. Clair)
Lake Ontario, 62%

NOTE: These figures are preliminary

Long Lac and Ogoki Diversions

Since the early 1940's, the flow of two rivers that naturally drained northward to James Bay has been diverted into Lake Superior. Due to very dry conditions, the diversions have been much less than usual this year. During the period from March through August 1998, the combined amount of these two diversions was only 26 percent of average. This reduction in water available for diversion is an indicator of the impact that the dry, warm conditions of the past several months had on runoff from the northern part of Lake Superior's drainage basin.

Repairs Completed

Repairs to the U.S. portion of the Compensating Works in the St. Marys River at Sault Ste. Marie were completed this summer. This repair program was initiated in 1995, and a part of the repairs was undertaken each of the past four summers. All repairs to the Canadian portion were completed in 1996. Gate repairs this year did not require flow deviations from the regulation plan, and did not impact lake levels.

Niagara Public Meeting

The International Niagara Board of Control held an open house that was sparsely attended on October 20th in Buffalo, New York. A presentation was made on Board and International Joint Commission (IJC) membership, Board duties, Great Lakes levels and the Lake Erie - Niagara River Ice Boom. Presentations were also made by representatives of Ontario Hydro on a proposed new diversion tunnel to supply water to the Sir Adam Beck hydro-electric generating stations and by the Buffalo and Fort Erie Public Bridge Authority on a proposed new bridge between Fort Erie and Buffalo. The Board, its associates and four IJC Commissioners discussed these and other items of interest with the public.

October Outflows From Great Lakes

As a percentage of the long-term October average:

Lake Superior 68%
Lake Huron 100%

Lake Erie 107% Lake Ontario 108%





Volume 6, Number 12

December 7, 1998

Dry Weather Persists Over Lower Lakes' Basin Lake Levels Continue Their Sharp Decline

Water levels on all of the Great Lakes continued to decline rapidly during November. It was another month of significantly below average precipitation over all of the basin except for the Lake Superior area.

While Lake Superior's water level declined by a lesser amount than did the other lakes, it continued its downward trend. The lake was at its lowest November level since 1926, and it was very

close to chart datum all month. At the beginning of December, Lake Superior's level was 26 centimetres below average level.

In late November, Lake Huron's level declined to below average, for the first time in three years. The combination of dry conditions and very low inflow from Lake Superior contributed to this decline. At the beginning of December, Lake Huron was one centimetre below its average level.

Despite a sharp decline, both Lakes St. Clair and Erie remain above their average levels. At the beginning of December, they were six and eight cm, respectively, above average.

Lake Ontario also continued to decline, but the rate slowed down as the month progressed. The level was virtually constant over the last week of the month. At the beginning of December, the lake was 23 cm below average.

Lake Michigan Potential Damage Study Underway

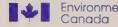
In 1996 the U.S. Army Corps of Engineers began a study to develop a method for evaluating the potential for damages along the shore of Lake Michigan. This project was in response to one of the recommendations of the International Joint Commission's Levels Reference Study completed in 1993.

Most of the damages along Lake Michigan's shore are the result of erosion. This project is placing particular emphasis on understanding the relationship between water levels and erosion, and the relationship between erosion and shore damage values.

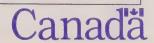
Since Lake Michigan is entirely within the United States, the project is totally funded within the U.S. However, it is hoped that the methods developed for this study will form the basis for future similar studies on other Great Lakes. For this reason, there is Canadian participation on the team that is directing the study.

Further information on the project is available on the World Wide Web at:

http://www.vgivision.com/LMPDS/. This Web site is presently under construction, and more information will be added to it over the coming months.







During much of November, the water level at Montreal harbour was very close or slightly below chart datum, a condition brought on by decreasing Lake Ontario outflows and very low flows from the Ottawa River and other tributaries to the St. Lawrence River. This has seriously affected navigation at Montreal. To provide some relief at Montreal harbour, the International St. Lawrence River Board of Control authorized some limited increase in Lake Ontario outflows. By the end of November, the Board's action had lowered Lake Ontario's level by three centimetres from what it otherwise would have been. While the extra discharge did help the level at Montreal harbour, it was still one metre below average and the November level was a new record low since 1967 for the harbour.

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Aussi disponible en français

November Precipitation Over Great Lakes

As a percentage of the long-term November average:

Great Lakes Basin, 99% Lake Superior, 133% Lakes Michigan-Huron, 102% Lake Erie, 60% (including Lake St. Clair) Lake Ontario, 63%

NOTE: These figures are preliminary

Shore Well Problems

In many areas along the shores of the Great Lakes, cottages and homes obtain their water supply from the lake by means of a shore well. The water level inside the shore well is the same as the lake's level. With the decline in lake levels, many of these shore wells are going dry.

Initially the problem may be intermittent, as the lake's level goes up and down in response to winds pushing the water from one side of the lake to the other. The interruption in water supply can become continuous with a larger decline in the lake's level. In other cases, the first sign of a problem is a slow recovery rate in the well after pumping.

This problem is particularly severe at the eastern end of Lake Ontario, where shore wells are very common, and along Lake Superior. While Lake Ontario is typically at its lowest level of the year by now, it is very possible that its level could continue to decline through the early part of winter, and it is virtually certain that Lake Superior's level will decline over the winter. As a result, the problem could become more prevalent over the next few months. More shore wells on the other lakes may also be affected, should their levels continue to decline.

As winter approaches, the risk of supply lines freezing is increased by the lower lake levels. Lines that are buried underwater are more susceptible since there is less water depth to provide insulation.

Lake Ontario Lowest Since 1965

Lake Ontario's November level of 74.34 metres was the lowest monthly level since 1965. It was two cm lower than the level of November 1991.

November Outflows From Great Lakes

As a percentage of the long-term November average:

Lake Superior 69% Lake Huron 101% Lake Erie 104% Lake Ontario 99%

MT 160 -G64

GREAT LAKES-ST. LAWRENCE RIVER WATER LEVELS

new

Volume 7, Number 1

January 7, 1999

Dry Weather Persists

Lake Levels Continue Downward Trend

All of the Great Lakes except Superior experienced a greater than average decline in their water levels during December, continuing the trend of the past several months. For the fourth consecutive month, precipitation was below average over the drainage basins of Lakes Erie and Ontario, and a new record low water level for December was set at Montreal harbour for the second consecutive month.

The annual water supply to Lake Superior during 1998 (runoff to the lake plus precipitation on the lake minus evaporation from the lake) was a new record low for this century. At the beginning of January, Lake Superior was 23 cm below average.

The water supply to Lakes Michigan and Huron for the period April to December was also a new record low. During December, the water level of these lakes was below average for the first month since October 1995. At the beginning of January, Lake Huron's level was

eight cm below average, while Lakes St. Clair and Erie were within two cm of their average levels.

Lake Ontario's level continued to decline in December, and it is now 28 cm below average. It is anticipated that the lake's level is very close to its low point for this winter and will not decline much further.

Public Hearings

The International Joint Commission has scheduled public hearings to receive comment on the proposed Peace Bridge capacity

expansion project and on the proposed redevelopment and expansion of Ontario Hydro's water diversion facilities in the Niagara River. The times and locations of hearings are as follows: January 27, 1999 at the Marriott Hotel 6740 Oakes Drive Niagara Falls, Ontario and January 28 at the Buffalo-Niagara Marriott 1340 Millersport Highway Amherst, NY. Both sessions will be 7:00 p.m. to 10:00 p.m. For further information contact Fabien Lengellé at 613-995-0088.

December Precipitation Over Great Lakes As a percentage of the long-term December average:

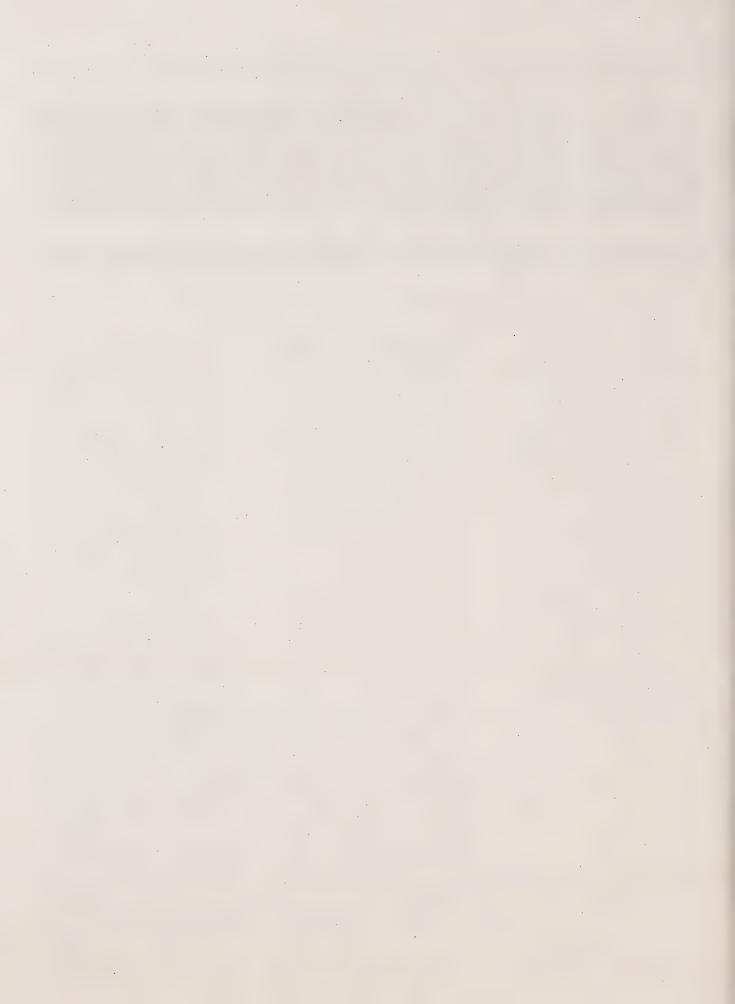
Great Lakes Basin. 77% Lake Superior, 100% Lakes Michigan-Huron, 73%

Lake Erie. 65% (including Lake St. Clair) Lake Ontario, 61%

December Outflows From Great Lakes

Lake Superior 75% Lake Erie 101% Lake Huron 102% Lake Ontario 96%







Volume 7, Number 2

February 5, 1999

Publications

Heavy Precipitation Raises Lake Ontario's Level Water Levels Near Low End of Seasonal Range

Water levels on Lakes Ontario and Erie began to rise during the last two weeks of January, while levels on Lakes Huron and Superior stabilized during the two week period. It now appears that Lakes Ontario, Erie and St. Clair have already hit their low points for the winter, while the other lakes are close to their seasonal low.

After four months of below average rainfall, the combination of heavy snowfall and rainfall led to above average precipitation during January over Lake Ontario's basin. This, combined with significant snowmelt late in the month, pushed up the lake's level. By the end of January, Lake Ontario was still 18 cm below average. Heavier precipitation and snowmelt also affected Lake

Erie's basin, and by the end of January its level was 12 cm above average.

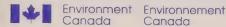
As a result of ice buildup in the Detroit River due to cold weather at the beginning of January, Lake St. Clair's water level rose by 40 cm in eight days. Warm weather entered the area around the middle of the month, which reduced the ice buildup, and (continued on next page)

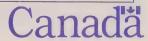
International Joint Commission Decides Not To Adopt New **Regulation Plan**

The International Joint Commission has decided not to adopt Plan 1998 for the regulation of Lake Ontario outflows at this time. The IJC determined that it does not have sufficient information on the environmental impacts associated with the proposed plan and that the plan would not provide sufficient improvement over the existing situation. The International St. Lawrence River Board of Control will continue to manage the waters of the Lake Ontario - St. Lawrence River system according to Plan 1958-D with the Board exercising its discretionary authority to deviate from the plan as situations arise, as is presently the case.

Plan 1998 was developed by the St. Lawrence River Board following studies, conducted by another IJC study board that ended in 1993, that examined issues related to water level fluctuations in the Great Lakes, including possible improvements to Plan 1958-D. Public meetings were held in the fall of 1997 to give interested parties an opportunity to learn about, and express their views on Plan 1998.

The IJC will continue to pursue funding for the more comprehensive studies outlined in a "Scope of Work" prepared by the St. Lawrence River Board. The purpose of these studies is to provide sufficient information for the Commission to determine whether or not changes are warranted to the IJC's criteria that govern Lake Ontario regulation.





the lake's level declined 40 cm in five days. At the end of January, the lake was 27 cm above average.

Lake Huron's level remained almost static during January, and by month's end it was six cm below average.

Meanwhile, the end of month level on Lake Superior was 23 cm below average.

Public Hearings Held

On January 27 and 28 the IJC held public hearings in Niagara Falls, Ontario and Amherst, New York to receive comments from the public and organizations on two proposed projects. One project is the twinning of the Peace Bridge between Fort Erie and Buffalo, and the second project is the construction by Ontario Hydro of a third tunnel to transport water from the Niagara River upstream of the falls to the Sir Adam

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January Precipitation Over Great Lakes

As a percentage of the long-term January average:

Great Lakes Basin, 152% Lake Superior, 104% Lakes Michigan-Huron, 161% Lake Erie, 154% (including Lake St. Clair) Lake Ontario, 204%

NOTE: These figures are preliminary

Beck generating stations at Queenston.

Some of the main points raised by the public were concerns that the piers of the Peace Bridge would have an impact on Lake Erie's water level (studies have shown that there will be zero impact) and concerns that an increase in the frequency of high discharge from the hydroelectric generating stations could have an impact on the fishery in that vicinity.

Both meetings were well attended, with about 45 at the Niagara Falls meeting and 40 at the Amherst meeting.

Lake Ontario Outflows

To provide relief to the Port of Montreal, which was affected by record low water levels during the fall, the International St.

Lawrence River Board of Control directed that the Lake Ontario outflow be more than the amount specified by the regulation plan. The overdischarges, which took place from late October through

December, were aimed at maintaining chart datum water level at the port. River ice below Montreal, brought on by cold air just prior to the New Year, raised the harbour's level and removed the need for further overdischarges. Beginning January 1, the Board resumed use of the regulation plan to determine outflows from Lake Ontario, except for variations necessary for ice management in the St. Lawrence River.

The extra release of water from Lake Ontario during the October - December period has resulted in an actual Lake Ontario level of about 7 cm lower than that which would have occurred if the regulation plan had been strictly followed. Although it was as much as 28 cm below seasonal average during this period, Lake Ontario remained at least one-half metre higher than in 1934.

January Outflows From Great Lakes

As a percentage of the long-term January average:

Lake Superior 80% Lake Huron 107% Lake Erie 100% Lake Ontario 93%

160 104

GREAT LAKES-ST. LAWRENCE RIVER WATER LEVELS

Volume 7, Number 3

March 5, 1999

Dry Weather Returns to Basin Water Levels Stable on Upper Lakes, Rise on Lower Lakes

Despite below average precipitation over most of the Great Lakes basin during February, the water levels of Lakes Superior and Huron were stable during the month while they would usually decline, and the levels of Lakes Erie and Ontario went up while they would usually be stable.

While the levels of Lakes Superior and Huron did move closer to their long-term

average levels, at the beginning of March they were 20 and 8 centimetres below average, respectively.

Lakes St. Clair and Erie are the only two of the Great Lakes with above average water levels. At the beginning of March the two lakes were 18 and 12 centimetres above average, respectively. Meanwhile, Lake Ontario was 17 cm below average.

Relatively mild weather over much of the Great Lakes basin in February has resulted in a considerable amount of snowmelt, particularly in the southern areas. Runoff from this melt has increased lake levels from what they otherwise would have been. Prior to heavy snowfall during the first week of March, much of the southern section of the basin had very little snow left to melt.

Little Ice Cover on Great Lakes

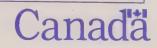
Ice cover over all of the Great Lakes was much less than average at the end of February. Lake Erie, Georgian Bay, most of Lake Superior and portions of Lake Huron would typically have 70% to 90% ice cover at this time of winter. However, conditions are much different this year.

While there is extensive ice in the western basin of Lake Erie and also in the northern half of the lake, much of the southern half of Lake Erie has little or no ice. The southwestern portion of Georgian Bay, including the Bruce Peninsula shoreline, also has very little ice, while Lake Huron is almost totally icefree. Lake Superior has ice covering most bays and in a narrow band along the shoreline, but most of the lake is free of ice.

The limited ice cover on the lakes indicates that there is a possibility the lakes will be completely clear of ice at an earlier time than usual. The shorelines could be fully exposed to waves during the stormy period of March and early April, but the significant decline in lake levels since last spring should reduce the risk of damages to shore properties.



Environment Environnement Canada



IJC Begins Investigation

The United States and Canadian federal governments have asked the International Joint Commission (IJC) to examine and report on the consumption, diversion and removal of waters along the common border, including removals in bulk for export. The IJC will begin a major investigation of how Canada and the United States use the waters along their common border by holding public hearings in eight cities.

The request from governments comes in the wake of proposals to export water overseas from Canada, and litigation involving the export of water from Canada to the United States. Both governments are concerned that existing management

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February Precipitation Over Great Lakes

As a percentage of the long-term February average:

Great Lakes Basin, 100% Lake Superior, 153% Lakes Michigan-Huron, 93% Lake Erie, 91% (including Lake St. Clair) Lake Ontario, 55%

NOTE: These figures are preliminary

principles and conservation measures may be inadequate to ensure future sustainable use of shared waters.

The request from the governments asks the IJC to consider the following matters: existing and potential consumptive uses of water; existing and potential diversions of water in and out of the transboundary basins, including withdrawals of water for export; the cumulative effects of existing and potential diversions and removals of water, including removals in bulk for export; and the current laws and policies as may affect the sustainability of the water resources in boundary and transboundary basins.

The public hearings will be held from 7:00 p.m. to 10:00 p.m. at the following Canadian locations:

March 17, 1999, **Montréal** Marriott Château Champlain Caf'Conc' Room 1 Place du Canada Montréal, Québec March 18, 1999, **Toronto** Crowne Plaza Hotel Ballroom A 225 Front Street West Toronto, Ontario

March 22, 1999
Sault Ste. Marie
Ramada Inn
Centre Ballroom
229 Great Northern Road
Sault Ste. Marie, Ontario

March 23, 1999, **Windsor**The Cleary International
Centre
Room Dieppe A
201 Riverside Drive West
Windsor, Ontario

Written comment may also be submitted at the public hearings, or to the IJC office during the course of this investigation:

Secretary, IJC 100 Metcalfe St., 18th Floor Ottawa, Ontario K1P 5M1

February Outflows From Great Lakes

As a percentage of the long-term February average:

Lake Superior 81% Lake Huron 112% Lake Erie 104% Lake Ontario 103%



Volume 7, Number 4

160

April 7, 1999

Dry Weather Over Most of Great Lakes Basin Lake Levels Well Below Those of Last Spring

Dry weather during March over most of the Great Lakes basin has restricted the rise in water levels that usually occurs during the month.

Most of March's precipitation fell in the first six days of the month, giving water levels a boost at that time. However, water levels declined over the remainder of the month on all of the lakes except Lake Ontario, due to the dry conditions and the slow snow melt that allowed much of the

meltwater to evaporate or be absorbed into the ground.

During March, Lake Superior was over 20 centimetres below its level the previous March, and it was at its lowest level since 1926. At the beginning of April, it was 21 centimetres lower than average, and 14 centimetres below chart datum. While it is anticipated that the lake's level will rise over the spring and summer months, it will likely remain well below average. The low level will

significantly impact the size of loads that commercial ships can carry this spring.

Lake Huron's level was about 50 centimetres below that of last March, and it was the lowest March level since 1990. At the beginning of April, it was 16 centimetres lower than average. If conditions stay dry, the lake's level this summer will be the lowest since 1966. If, however, precipitation is near (continued on next page)

IJC Public Hearings Held

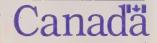
In March the IJC held a series of eight public hearings around the Great Lakes - St. Lawrence basin as part of their investigation on the consumption, diversion and removal of waters, including removals in bulk for export. Attendance ranged from 50 to 100 at the hearings held in four Canadian and four U.S. cities.

At all eight meetings, the opinions expressed by participants were overwhelmingly opposed to the diversion or export of water from the Great Lakes system. Concerns about the impacts such actions would have on the environment and about the setting of a precedence for larger exports in the future were frequently expressed.

A preliminary report on the study is scheduled for delivery to the Canadian and U.S. governments this August, and the final report is due in February 2000. Further information on the study and a forum for expressing views is available at: http://www.ijc.org/boards/cde/cdefront.html.







average over the next few months, then the lake's level will be slightly below that of 1990.

During March, both lakes St. Clair and Erie were almost 60 centimetres lower than last March. Despite this steep decline, at the beginning of April, Lake St. Clair was right at its average level, and Lake Erie was three centimetres above average. The levels of these lakes are likely to remain close to average into the summer months.

The largest decline from last year's level has occurred on Lake Ontario, which was 65 centimetres lower than March 1998. At the beginning of April, the lake's level was 21 centimetres lower than average, but it has risen by 30 centimetres since the beginning of the year. It is very likely that the lake's level will remain slightly below average over the spring and early summer.

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March Precipitation Over Great Lakes

As a percentage of the long-term March average:

Lake Erie. Great Lakes Basin, 55% (including Lake St. Clair) 66% Lake Superior. Lake Ontario, 110% Lakes Michigan-Huron, 32%

NOTE: These figures are preliminary

Montreal Harbour is also experiencing low water levels. During March, it was about 80 centimetres below average, and only 20 centimetres above the record low for March.

The rapid decline in water levels over the past year will create some difficulties for recreational boating and commercial navigation, as well as for some cottages and homes that draw their water from the Great Lakes and connecting rivers. On the positive side, the risk of flood and storm damage has been greatly reduced with the decline in levels.

Boaters Beware

While lower water levels this year is good news for shore property owners who have suffered flood and storm damage in the past, it is not so favourable for recreational boaters. With lake levels anticipated to be 10 cm to 40 cm lower than last summer, recreational boaters could experience problems.

Most problems relate to insufficient draft for boats. Some marinas may experience problems accommodating larger boats, and may need to do some dredging. Access to marinas located up rivers from the lakeshore may be more difficult due to less depth in river mouths. Private docks may need to be extended or relocated in some cases. The lower levels could also pose problems for boat access to islands.

56%

One of the greatest risks this summer is that rocks, shoals and other obstructions that were covered with sufficient water for safe passage last summer may now catch keels and propellers.

On the positive side, there will be additional clearance this summer under overhead obstructions such as bridges.

March Outflows From Great Lakes

As a percentage of the long-term March average:

Lake Superior 82% Lake Erie 94%

Lake Huron Lake Ontario 103% 103%





LEVE news

Volume 7, Number 5

May 7, 1999

Water Levels on All Lakes Rise During April Upper Lakes Begin Their Annual Seasonal Rise

Monthly mean water levels on Lakes Superior and Huron rose slightly during the month of April suggesting that the upper lakes have joined Lakes Erie and Ontario in their annual seasonal rise.

During April, the average level of Lake Superior rose 5 cm reversing the downward trend in levels it has experienced since last July. At the beginning of May, the lake remains about 20 cm below its long-term average,

and about 6 cm below chart datum. Even with increasing levels expected over the next few months, levels on Lake Superior will likely remain below average.

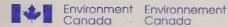
Despite near average precipitation, the average level of Lake Huron rose just 1 cm from March to April-only a fraction of its usual 9 cm rise. A 5 cm increase in levels from the beginning of April to the beginning of May suggests that it too may be starting its seasonal rise.

Lake Huron's level was about 63 cm below that of last April, and was the lowest April level since 1967. The lake level is still, however, about 64 cm above the record low for the month recorded in 1964.

Higher than average precipitation over the Lakes St. Clair and Erie basins boosted their levels about 14 cm and 13 cm, respectively, during the month of April. At the beginning of May (continued on next page)

All Lakes Still Well Above 1918-98 Period-of-Record Lows

Over the past one or two years, the water levels on the Great Lakes have fallen dramatically from levels approaching the record highs of 1985 or 1986 to levels as much as 20 to 30 cm below average on Lake Superior and Ontario, and to near average on Lakes St. Clair and Erie. While lower water levels this year is good news for shore property owners who have suffered flood and storm damage, it is not so favourable for commercial and recreational boaters who have grown accustomed to the higher than average levels experienced over the recent past. Although water levels are significantly lower it is important to note that all lakes remain well above their record lows for the 1918-98 period of record used for comparison purposes. Lake Superior remains about 40 cm above its record low, while the remaining lakes are 60-90 cm above theirs.





both lakes were within 4 cm of their averages. Although lower Lake Huron outflows will affect their levels, both lakes are likely to remain near average into the summer months.

Lake Ontario levels continue to climb, increasing by 13 cm over the month. Despite this increase, at the beginning of May the lake's level was 29 cm below average. Below average levels are expected to continue through the summer unless very high supplies are experienced.

Montréal Harbour levels rose during the month but remain about 70 cm below average and about 60 cm above the record low for April.

Public Meeting

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April Precipitation Over Great Lakes

As a percentage of the long-term April average:

Great Lakes Basin 103% Lake Erie 134%
Lake Superior 83% (including Lake St. Clair)
Lakes Michigan-Huron 113% Lake Ontario 55%

NOTE: These figures are preliminary

Scheduled

The International St. Lawrence River Board of Control will hold a public meeting to discuss the regulation of outflows and water levels of Lake Ontario and the St. Lawrence River. The meeting will be held on June 2, 1999 from 7:00 p.m. until 9:30 p.m. at the Cornwall Civic Complex, 100 Water Street East, Cornwall, Ontario. The Board Secretaries will accept telephone pre-registration for people who wish to speak.

For details, or to address the meeting, please contact:

Mr. Ed Eryuzlu Board Secretary, Canadian Section Tel.: (613) 990-5617

April Outflows From Great Lakes

As a percentage of the long-term April average:

Lake Superior 76% Lake Erie 101% Lake Huron 94% Lake Ontario 95%



Volume 7, Number 6

June 7, 1999

Seasonal Rise Stalls on Middle Lakes Water Levels Drop at Montréal Harbour

Lakes Superior and Ontario monthly mean water levels rose about 8 cm from April to May, while smaller increases on the middle lakes suggest their seasonal rise has stalled. Water levels dropped significantly at Montréal Harbour.

Precipitation on the Lake Superior basin caused water levels to rise steadily during the latter part of May. The lake's monthly mean level increased by about its usual amount for this time of year. At the beginning of June the lake remains about 17 cm below its long-term average, but levels have increased to above chart datum.

Despite precipitation received over the Victoria Day weekend. the middle lakes experienced lower than average increases during May. Daily levels actually fell slightly during parts of the month. Mean monthly levels on Lakes Michigan-Huron and Erie increased by just 4 and 3 cm. respectively, compared to last month. Lake St. Clair's level remains virtually unchanged. On average, these three lakes rise between 8 and 10 cm at this time of year.

Although Lake Ontario's May level was 8 cm higher than April's it usually increases by about 13 cm at this time of year.

At the beginning of June, Lakes Michigan-Huron and Ontario were between 25 and 30 cm below their long-term averages. Lakes St. Clair and Erie were 5 to 10 cm below their averages.

Montréal Harbour's mean level fell about 1.2 m from April to May. The harbour's May level was more than 1.7 m below average and was a new record low since 1967 for the month. This level is close to the low experienced in 1964. By the end of the May, the harbour's level was about 10 cm below chart datum.

Lower Water Levels Mean New Hazards

A recent letter to the Opinions page of *The Hamilton Spectator* highlighted a hazard often forgotten when discussing the recent drop in Great Lakes water levels. With youngsters about to begin enjoying their summer vacations, the author of the letter wanted to warn children and those responsible for their well-being, of the danger they face with water levels down significantly from last year.

Running off the dock or down the beach for that first dive of the year can result in serious, permanent damage to the head, neck and back. With levels much lower than last year, it is imperative that anyone responsible for children—parents, grandparents and camp counsellors—make them aware that as much as 65 cm of water is not there due to the dry conditions we are currently experiencing. Please check where the rocks are for swimming as well as boating and have a fun-filled, accident-free summer.

Level News is grateful to Mr. K. B. Paulin, of Burlington, for allowing us to share his timely message here.







Accessing Water Level Data by Telephone

Present water levels on the Great Lakes and St. Lawrence River are available from a network of gauging stations operated by the Canadian Hydrographic Service. Phone numbers for the stations are listed below. When you call a particular station, the answering equipment will ask you to press 1 for English or 2 for French, on the keypad of your touch-tone phone. If you do not have a touch-tone phone, the message will start after a few seconds delay. The present water level is given in metres relative to chart datum at that station. Next the message gives the high and low water levels recorded during the previous 12 hours, followed by the elevation of chart datum. You can press 1 or 2 at any time during the message to have it start again, or press 0 to end the call. Call (905) 336-4844 (fax: (905)-336-8916 or e-mail: solvasonr@dfo-mpo.gc.ca) to report any problems or to obtain additional information.

FOR MORE INFORMATION:

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http://www.cciw.ca/glimr/

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Editor, Chuck Southam Aussi disponible en français

May Precipitation Over Great Lakes

As a percentage of the long-term May average:

Great Lakes Basin 103% Lake Erie 93%
Lake Superior 135% (including Lake St. Clair)
Lakes Michigan-Huron 100% Lake Ontario 60%

NOTE: These figures are preliminary

Lake Superior	at Rossport at Michipicoten at Gros Cap	(807) 344-3141 (807) 824-2250 (705) 949-1886 (705) 779-2052
St. Marys River		(705) 949-2066 (705) 254-7989
North Channel	at Thessalon at Little Current	(705) 842-2215 (705) 368-3695
Georgian Bay	at Parry Sound at Collingwood	(705) 746-6544 (705) 445-8737
Lake Huron	at Tobermory at Goderich	(519) 596-2085 (519) 524-8058
St. Clair River	at Point Edward at Port Lambton	(519) 344-0263 (519) 677-4092
Lake St. Clair Detroit River	at Belle River at Amherstburg	(519) 728-2882 (519) 736-4357
Lake Erie	at Bar Point at Kingsville	(519) 736-7488 (519) 733-4417
	at Erieau	(519) 676-1915 (519) 782-3866
	at Port Stanley at Port Dover	(519) 583-2259
Lake Ontario	at Port Colborne at Port Weller	(905) 835-2501 (905) 646-9568
	at Burlington at Toronto	(905) 544-5610 (416) 868-6026
	at Cobourg at Kingston	(905) 372-6214 (613) 544-9264
St. Lawrence Riverat Brockville		(613) 345-0095
	at Iroquois above lock at Iroquois below lock	(613) 652-4839
	at Morrisburg at Cornwall	(613) 543-3361 (613) 930-9373
	at Summerstown	(613) 931-2089

May Outflows From Great Lakes

As a percentage of the long-term May average:

Lake Superior 72% Lake Erie 99% Lake Huron 95% Lake Ontario 87%



news

Volume 7, Number 7

July 7, 1999

Low Water Levels Continue to Cause Concern for Boaters

Water levels in most parts of the Great Lakes system remain low and are a cause of concern especially to boaters and commercial navigation. Levels of the St. Lawrence River at Montréal and on all the Great Lakes, except Superior, have not been lower. at this time of year since the 1960's.

The levels of all of the Great Lakes remain below average and much below their level of a year ago. The levels of Lakes Superior and Michigan-Huron are expected to continue to rise by a few centimetres in July, while the levels of the other lakes are expected to begin to decline

in July unless water supplies are much greater than average.

Great Lakes basin precipitation for June was about 107% of average. The water supplies to all the Great Lakes were below average for the month.

The water levels of Lakes Superior and Michigan-Huron rose by slightly less than their usual amounts during June. The level of Lake St Clair rose by more than the usual amount in June due in part to significant local rainfall near month-end. Lake Erie's level remained about the same in June rather

than rising as it usually does at this time of year. Lake Ontario experienced much less than normal supplies in June, but due to the low outflow its level rose in June rather than declining slightly as it does on average.

Montreal Harbour's mean level of 5.56 m in June was 0.11 m below the level of the previous month, and 1.27 m lower than the 1967-98 average for June. The daily mean level at the harbour was below chart datum for 16 days of the month.

While last month's level at the harbour set a new record

(continued on next page)

Lake Ontario Outflow Strategy

The International St. Lawrence River Board of Control continued its regulation strategy during June to offset the over-discharge deviations, by releasing from Lake Ontario outflows less than specified by the regulation plan. The over-discharge deviations (that is, outflow more than specified by the regulation plan) took place last fall to alleviate the very low water level conditions at the Port of Montréal. Further very small reductions below plan flows are expected over the next few weeks in order to totally offset the remaining over-discharge deviations, which amount to about a one centimetre lowering on Lake Ontario at the end of June.



Environment Environnement





low for the month of June in the post-1967 period, readers should note that lower levels occurred in 1964-65 about the same time record low water levels also occurred on the Great Lakes. For water level comparison at Montréal, water level data beginning in 1967 is used because the last major channel changes took place in the St. Lawrence River at Montréal just prior at that time.

Lake St. Lawrence Boaters See Higher Levels

While boaters and marinas throughout the Great Lakes are experiencing lower water levels, boaters on Lake St. Lawrence just above the Moses-Saunders dam are enjoying levels well above average thanks to very low flows at the dam. But as with our advice to all boaters

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Editor, Chuck Southam Aussi disponible en français

June Precipitation Over Great Lakes

As a percentage of the long-term June average:

Great Lakes Basin 107% Lake Superior 142% Lakes Michigan-Huron 127% Lake Erie 77% (including Lake St. Clair) Lake Ontario 85%

NOTE: These figures are preliminary

everywhere, caution is advised whenever and wherever you venture. Increased water levels on Lake St. Lawrence have submerged some high spots which otherwise can be seen with the naked eye.

Public Meeting Draws Large Crowd

The International St.
Lawrence River Board of
Control held its annual public
meeting to discuss the
regulation of outflows and
water levels of Lake Ontario
and the St. Lawrence River
on June 2, 1999 at the
Cornwall Civic Complex in
Cornwall, Ontario. The
meeting was attended by over
160 people who came to
share their views and
concerns with the Board.

Open House Scheduled

The International Niagara Board of Control is holding an open house on Tuesday, September 14 at 7:30 p.m. at the Old Stone Inn, 5425 Robinson Street, Niagara Falls, Ontario (905) 357-1234.

The purpose of this open house is to inform the public of the Board's current activities, discuss plans to modify the IJC Order of Approval for installation of the Lake Erie - Niagara River Ice Boom and to hear public comments and suggestions regarding the Board's work. In addition, information will be presented on Great Lakes' water levels.

June Outflows From Great Lakes

As a percentage of the long-term June average:

Lake Superior 96% Lake Huron 92% Lake Erie 92% Lake Ontario 84%

Volume 7, Number 8

160

August 6, 1999

Upper Lakes Receive Higher Than Average Precipitation During July **Dry Weather Persists Over Lower Lakes**

Great Lakes basin precipitation was above average in July, with above average rainfall on the upper lakes while the lower lakes experienced drier conditions. For the fourth consecutive month, Lake Ontario's basin had below average precipitation.

During July, Lake Superior's basin received 147% of its average monthly rainfall. The lake's water level rose 13 cm during July and in early August remains 9 cm below seasonal average. The present level is a few centimetres higher than the level recorded one year ago.

In response to higher water supplies, Lakes Michigan-Huron rose 5 cm during July, but still remains 22 cm below average. While the present levels are down about 40 cm from last year, they are more than 60 cm above the record low for this time of year experienced in 1964.

The Lake Erie basin (which includes Lake St. Clair) received just 70% of its average precipitation in July. Water levels on Lakes St. Clair and Erie fell by 6 and 4 cm, respectively, from the beginning to the end of July. At the beginning of August, both lakes were about 7 cm

below average. Water levels on both lakes are expected to continue to decline in August.

Despite the lack of rainfall, high evaporation and low basin runoff, Lake Ontario's water level remained virtually unchanged from the beginning to the end of July. The low Lake Ontario outflow specified by the lake's regulation plan is the offsetting factor. It appears that the lake reached its peak level for the year on July 10 with a daily mean level of 74.84 m. At the beginning of August, Lake Ontario was about 15 cm below average. (continued on next page)

Open House Reminder

The International Niagara Board of Control is holding an open house on Tuesday, September 14 at 7:30 p.m. at the Old Stone Inn, 5425 Robinson Street, Niagara Falls, Ontario.

The purpose of this open house is to inform the public of the Board's current activities, discuss plans to modify the IJC Order of Approval for installation of the Lake Erie - Niagara River Ice Boom and to hear public comments and suggestions regarding the Board's work. In addition, information will be presented on Great Lakes' water levels.



Due to low flows from Lake Ontario and other tributaries to the St. Lawrence River, Montréal Harbour continues to experience very low water level conditions. The daily mean level for the harbour was below chart datum on 15 days in July, and could remain below chart datum in August.

Did You Know?

The size of the Great Lakes - St. Lawrence River system is awesome. The basin upstream of the power dam on the St. Lawrence River at Cornwall, Ontario/Massena, New York covers about 774 000 km². The five Great Lakes contain about 23 000 km³ of water covering a total area of about 244 000 km²-just under one-third of the basin's total area.

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Editor, Chuck Southam Aussi disponible en français

July Precipitation Over Great Lakes

As a percentage of the long-term July average:

Great Lakes Basin 131% Lake Erie 70%
Lake Superior 147% (including Lake St. Clair)
Lakes Michigan-Huron 151% Lake Ontario 83%

NOTE: These figures are preliminary

Flow Measurements

During August, personnel from Environment Canada and the U.S. Army Corps of Engineers will be taking water flow measurements at the Lake Superior Compensating Works, located at the head of the Whitefish Rapids in the St. Marys River between Sault Ste. Marie, Ontario and Michigan. These measurements are part of an ongoing program to verify the accuracy of the flows in the Great Lakes - St. Lawrence River system.

Lakes Superior and Ontario Regulation

The August outflows of Lake Superior and Lake Ontario (the only two lakes that are regulated) will be as specified by the regulation plans for these lakes, according to the IJC Boards that oversee outflow regulation.

July Outflows From Great Lakes

As a percentage of the long-term July average:

Lake Superior 96% Lake Erie 96% Lake Huron 93% Lake Ontario 84%



LE Lanews

Volume 7, Number 9

September 8, 1999

Below Average Water Levels Persist on the Great Lakes

Water levels of the Great
Lakes declined during August
and the trend is expected to
continue throughout the rest
of the year. Although
precipitation over parts of the
Great Lakes basin was above
average last month, high
evaporation and low tributary
flows kept the water supplies
to the lakes low.

The monthly mean level of Lake Superior rose 4 cm from July to August; however, trends in daily water levels suggest the lake has started its seasonal decline. Daily levels rose during the first half of the month peaking at 183.50 m on August 18. Since that time levels have fallen gradually and the lake was at 183.45 m by early September, about 9 cm below the average for that time of year.

Having peaked earlier than Lake Superior, the downward trend in levels is more pronounced on the remaining lakes. From the beginning to the end of August, Lakes Michigan-Huron, St. Clair and Erie daily levels fell 10, 6 and 14 cm, respectively.

Since peaking in early July,
Lake Ontario continues to fall
at a steady pace seeing a drop
of about 16 cm from the
beginning of August to the
end of the month.

Given the continuing below average water level conditions, recreational boaters and marina operators may wish to consider hauling out large boats earlier than usual this Fall. Lakes Michigan-Huron, St. Clair (continued on next page)

IJC recommends moratorium on bulk removals and sales of Great Lakes water

In its interim report under the Water Uses Reference, released on August 18, 1999, the International Joint Commission (IJC) recommends that, for the next six months while the IJC completes its investigation, U.S. and Canadian federal, state and provincial governments should not authorize or permit any new bulk sales or removals of surface water or groundwater of the Great Lakes basin and should continue to exercise caution with regard to consumptive uses of these waters, in accordance with existing laws in both countries and the Great Lakes Charter.

The interim report responds to the request made by the governments in their February 10, 1999 Water Uses Reference for interim recommendations for the protection of the waters of the Great Lakes. A final report will be submitted to the governments by February 2000, after completion of phase II of the IJC's study. For more information on the interim report and other IJC activities please visit their web site at http://www.ijc.org/ijcweb-e.html or call Fabien Lengellé of the IJC in Ottawa at (613) 995-0088.



and Erie are all down about 43 cm from last year. Lake Ontario is about 23 cm lower than it was at this time last year.

Levels at the Port of Montréal during August set a new record low for the post-1967 period. Very low flows from Lake Ontario, the Ottawa River and other local tributaries to the St. Lawrence River continue to cause concern for port officials.

While low water levels dominate elsewhere, levels on Lake St.
Lawrence just above the Moses-Saunders dam at Cornwall remain above average. Due to the low flows at the dam, levels on Lake St.
Lawrence this summer have been above average and about one-half metre higher than the two previous summers. Last month's Lake Ontario outflow was 6290 m³/s. The last time flow was this low for the month of August was in 1966.

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Editor, Chuck Southam

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August Precipitation Over Great Lakes

As a percentage of the long-term August average:

Great Lakes Basin 93% Lake Erie 66%
Lake Superior 114% (including Lake St. Clair)
Lakes Michigan-Huron 89% Lake Ontario 92%

NOTE: These figures are preliminary

Why Surf When You Can Dive Into The Great Lakes!

Environment Canada is proud to present *OUR GREAT LAKES*, the premier source for current and historical information on the Great Lakes Basin Ecosystem. *OUR GREAT LAKES* replaces the *Great Lakes Information Management Resource (GLIMR)*, with improved navigability, a new look and a new name. *OUR GREAT LAKES* is housed on Ontario Region's Green Lane web site, which promotes and facilitates public access to environmental information.

Building on GLIMR's success, *OUR GREAT LAKES* provides visitors with a client-driven menu and highlights such items as the Department's current Great Lakes 2000 Program and activities surrounding the next phase of the initiative on the *Great Lakes Beyond 2000* page. For current news releases, recently launched web pages and upcoming events, check out *What's Making News*. If maps interest you, explore *Great Maps*, for a selection of internally developed maps including the Great Lakes drainage basin and selected areas on the Niagara Peninsula that are susceptible to groundwater contamination.

Additional menu topics include:

- Weather, Climate and Water Levels
- State of the Great Lakes
- Educational Resources, Great Links and Success Stories

We hope you'll visit *OUR GREAT LAKES* at: http://www.cciw.ca/glimr/intro-e.html

August Outflows From Great Lakes

As a percentage of the long-term August average:

Lake Superior 111% Lake Erie 91% Lake Huron 93% Lake Ontario 87%



Volume 7, Number 10

October 8, 1999

Great Lake Levels Continue to Decline **Fall Storm Season Begins**

Lake Superior water levels rose slightly during the first half of September, in response to precipitation, then began to decline again, ending the month 3 cm lower than at the start of the month. Currently, the lake is about 14 cm below average, but 12 cm higher than the level of a year ago.

Water levels on the other Great Lakes also continued with their seasonal decline. Lake Ontario, however, experienced a temporary rise of a few centimetres due to the rainfall in September.

At the beginning of October, Lake Huron is 31 cm below seasonal average and 40 cm below its level of a year ago. Lakes St. Clair, Erie and Ontario are 12 to 14 cm below average. Both Lakes St. Clair and Erie are around 37 cm below their levels of last year, while Lake Ontario is about 8 cm lower than its level recorded a year ago.

The levels of all lakes are expected to continue to decline in October. Mariners are cautioned that below average water level conditions will continue to prevail.

The remnants of Hurricane Floyd passed over the lower St. Lawrence River basin in

(continued on next page)

IJC Appoints Distinguished Environmental Scientist to International St. Lawrence River Board of Control

The International Joint Commission (IJC) has appointed Dr. Theodore L. Hullar as a member of its International St. Lawrence River Board of Control (the Board). Dr. Hullar serves as director of the Cornell University Center for the Environment and brings to the Board more than 25 years of experience in dealing with environmental and water issues.

After careful consideration of all the names put forward, the six IJC Commissioners selected Dr. Hullar as the best qualified candidate to serve in the interests of the entire Lake Ontario-St. Lawrence River system and to fill the needs of the Board at this time, particularly the need for environmental expertise.

For more information on this appointment to the Board and other IJC activities please visit the IJC web site at www.ijc.org or call Fabien Lengellé of the IJC in Ottawa at (613) 995-0088.

mid-September dropping a significant amount of rainfall. Several other weather systems that followed later in the month also brought moisture to the Lake Ontario - St. Lawrence River system. They brought improvements to the levels at the Port of Montréal, where levels which have been below chart datum since July saw a recovery to near chart datum conditions by late September. Although there have been some improvements also on Lake St. Louis (located immediately upstream of Montréal), low water levels in that part of the St. Lawrence River remain a subject of concern to Seaway vessels transiting between Montréal and Lake Ontario.

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Editor, Chuck Southam

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September Precipitation Over Great Lakes
As a percentage of the long-term September average:

Great Lakes Basin 111% Lake Superior 138% Lakes Michigan-Huron 96%

Lake Erie 85% (including Lake St. Clair) Lake Ontario 138%

NOTE: These figures are preliminary

The decline in water levels experienced over the last two years will help reduce the risk of serious flood and erosion damage to shore property due to storms this Fall. While the risk to shore property is reduced, readers are reminded to exercise caution when near the water's edge during a storm event. Over the years, many people standing too close to the water during a storm have been seriously injured, even killed, when struck by a wave generated by the storm.

Lakes Superior and Ontario Regulation

The outflows of Lake Superior and Lake Ontario during October are expected to be the amount specified by their respective regulation plan.

Last Edition for Sixmonth Subscribers

For those of you who are on our mailing list for the Water Level Bulletin and Level News for the six months from Spring to Fall only, this is the last edition you will receive this year. You will automatically start receiving both publications again in May 2000. If you would like to check water level conditions between now and then, please call us at one of the phone numbers provided in the For More Information box, or, if you have access to the internet you can go to: http://www.cciw.ca/glimr/ intro-e.html and visit the OUR GREAT LAKES site.

September Outflows From Great Lakes As a percentage of the long-term September average:

Lake Superior 105%
Lake Huron 91%

Lake Erie 91% Lake Ontario 88%

NOTE: These figures are preliminary

Stormy Season Begins



Volume 7, Number 11

November 8, 1999

Water Supplies to the Great Lakes Remain Low in October Water Levels Rise Above Chart Datum at Montréal Harbour

Water supplies to the Great Lakes were low again in October. The levels of all of the Great Lakes remain below average and, with the exception of Lakes Superior and Ontario, are much below their levels of a year ago. The levels of Lakes Michigan-Huron, St. Clair and Erie have not been lower at this time of year since the mid-1960s. Increased

outflows from the Ottawa River and other tributaries caused the level of the St. Lawrence River at Montréal to rise significantly above chart datum in the latter half of October.

According to preliminary reports, Great Lakes basin precipitation for October was about 97% of average. Water supplies to all of the lakes were below average. The

levels of Lakes Superior, Michigan-Huron and St. Clair declined by more than their usual amounts during October. The levels of Lakes Erie and Ontario declined by about their average rate in October. The levels of all of the Great Lakes are expected to decline in November unless water supplies are much greater than average.

(continued on next page)

IJC Announces Plan of Study to Review Lake Ontario-St. Lawrence **River Regulation**

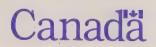
The International Joint Commission (IJC) has released a Plan of Study describing in detail the work required to review the regulation of water levels and flows in Lake Ontario and the St. Lawrence River.

On October 15, 1999 the IJC transmitted the Plan of Study to the Governments and requested the Governments' assistance in securing the resources needed to carry out the work. The work described in the Plan of Study is extensive and encompasses detailed technical studies, impact assessment and development of alternatives. Ongoing public consultation will be an important component. The entire effort is projected to cost \$10.1 million (U.S.) plus \$15.8 million (Canadian) and take five years to complete.

The IJC had previously prepared a Scope of Work describing in a more general fashion the work required to review the regulation of water levels and flows. It held numerous meetings to obtain public comment on the Scope of Work before providing it to the Governments of the United States and Canada in 1996.



Environment Environnement



At the beginning of November, Lake Superior's level was about 16 cm below its seasonal average, but about 12 cm above the level recorded last year. The level of Lakes Michigan-Huron was about 38 cm below its long-term average beginning of November level and about 40 cm below the level of one year ago. Lakes Michigan-Huron's level is now only about 10 cm above chart datum. The last time the level of Lakes Michigan-Huron was about this low at this time of year was in 1966.

The October rainfall on the Lake Ontario basin helped slow down the seasonal decline in the water level of the lake. At the beginning of November it was 15 cm below its seasonal average. Lake Erie's level is currently about 11 cm below average.

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October Precipitation Over Great Lakes

As a percentage of the long-term October average:

Great Lakes Basin 97%
Lake Superior 132%
Lakes Michigan-Huron 79%

Lake Erie 89% (including Lake St. Clair) Lake Ontario 96%

NOTE: These figures are preliminary

Compared to one year ago, Lake Ontario is 2 cm higher while Lake Erie is 28 cm lower.

October rainfall on the St. Lawrence valley and the Ottawa River basin has brought considerable improvements to water level conditions for commercial navigation in the Montréal region. In response to the increased flow from the Ottawa River and other tributaries, the water levels in the St. Lawrence River in the Montréal area rose considerably during the last two weeks of October. Since October 14, the daily mean levels at the Port of Montréal have remained above chart datum, and at present the level at the harbour is about 57 cm above datum.

Lakes Superior and Ontario Regulation

The outflow from Lake Superior averaged 2290 m³/s in October, equal to the long-term average for the month.

Outflow in November will be decreased to 2020 m³/s, as specified by Plan 1977-A. This is less than the long-term average outflow for November.

The October outflow from Lake Ontario averaged 6170 m³/s, about 11% below average for the month. The flow is expected to continue at a similar rate in November in accordance with Plan 1958-D.

October Outflows From Great Lakes

As a percentage of the long-term October average:

Lake Superior 100% Lake Huron 90% Lake Erie 92% Lake Ontario 89%



Volume 7, Number 12

December 8, 1999

Lake Ontario Basin Sees Slightly Wetter Conditions in November Conditions on Upper Lakes Continue to be dry

November brought somewhat wetter conditions to the Lake Ontario basin while conditions on the upper lakes continued to be dry.

The levels of Lakes Superior and Michigan-Huron declined by more than their usual amounts in November. The levels of Lakes Erie and St. Clair declined by about their average amounts during

the month. Rather than declining, as it usually does in November, the level of Lake Ontario rose a few centimetres.

The levels of all of the Great Lakes remain below average. The levels of all of the lakes except Lake Ontario are expected to decline in December unless water supplies are much greater than average. Lake Ontario's level is expected to remain about the same.

At the beginning of December, Lake Superior's level was about 19 cm below its seasonal average. The level of Lakes Michigan-Huron was about 41 cm below its average beginning of month level and is now at (continued on next page)

Ice Boom News

Each winter since 1964, the Lake Erie-Niagara River Ice Boom has been installed near the outlet of Lake Erie to reduce the amount of ice entering the Niagara River. As a result of the boom, ice jams in the river and damage to shoreline property have been minimized while water flow for hydro-electric power production has been maintained.

Use of the ice boom is authorized by the International Joint Commission (IJC). Ownership as well as the cost of operating and maintaining the boom is shared equally by the New York Power Authority and Ontario Power Generation. Installation, operation and removal of the boom is done by the New York Power Authority and is monitored on behalf of the IJC by its International Niagara Board of Control.

Under the IJC's 1984 Order of Approval, installation could begin when the Lake Erie water temperature at Buffalo, NY reached 4°C (39°F). Last winter, due to the mild weather, this condition did not occur until the beginning of January 1999. The result of this late start was increased risk to the safety of the installation crew with the onset of freezing temperatures and severe weather conditions. In addition, there was the real possibility that complete installation would not be accomplished before a significant lake ice run began. (continued on next page)

Environment Canada

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chart datum. Lakes St. Clair, Erie and Ontario were 17, 11 and 8 cm below their seasonal averages, respectively.

November was the first month since April 1999 that the Montréal Harbour level did not set a new minimum record for the month. The harbour's November level was 0.27 m higher than the level recorded in November 1998, but still 0.76 m lower than the 1967-98 average for the month. The level at the harbour was above chart datum throughout November.

Lakes Superior and Ontario Regulation

The outflow from Lake Superior averaged about 10% below the long-term average for the month. The outflow will be increased slightly in December to 2040 m³/s, as

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Editor, Chuck Southam

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November Precipitation Over Great Lakes

As a percentage of the long-term November average:

Great Lakes Basin 70%
Lake Superior 61%
Lakes Michigan-Huron 57%

Lake Erie 87% (including Lake St. Clair) Lake Ontario 117%

NOTE: These figures are preliminary

specified by Plan 1977-A. This is almost equal to the long-term average outflow for December.

The average November outflow from Lake Ontario was below that specified by Plan 1958-D. Reductions of 200 m³/s below those specified by Plan 1958-D were made on days with relatively high downstream levels. The November outflow averaged 6010 m³/s, about 12% below average for the month. The flow specified by Plan 1958-D is expected to continue at a similar rate in December.

Ice Boom News (continued from page 1)

The IJC requires that its
Order of Approval for the ice
boom be reviewed at least
every five years by the
International Niagara Board
of Control with
recommendations being made
should changes be indicated.
The Board recently
completed its review and

recommended altering the Order of Approval by maintaining the present 4°C (39°F) water temperature requirement, but establishing a fixed date, December 16, when installation may begin should the water temperature remain above 4°C (39°F).

Interested parties on both sides of the border were contacted and a public presentation on the proposal given by the International Niagara Board of Control at its recent open house. There was no opposition to this proposed change. The IJC has, therefore, on the recommendation of its International Niagara Board of Control, amended its Order of Approval to reflect this criterion change.

November Outflows From Great Lakes

As a percentage of the long-term November average:

Lake Superior 90% Lake Huron 89% Lake Erie 94% Lake Ontario 88%





Volume 8, Number 1

January 7, 2000

Lake Ontario's level rises slightly **Conditions on Great Lakes Continue to be Dry**

For most of the Great Lakes, December was a repeat of the conditions that have occurred the past several months: below average precipitation and declining water levels. All of the lakes except Ontario declined as much or more than usual for this time of the year.

Lake Superior ended 1999 at almost exactly the same level as one year earlier, but about 19 cm below average. At the end of December, Lake Huron was 43 cm below average and about 37 cm above the record low set in 1964. Meanwhile, Lakes St. Clair and Erie ended the year 17 cm and 16 cm below average, respectively.

Unlike other parts of the system, water levels increased slightly during December on Lake Ontario and the St. Lawrence River. Above average flows from the Ottawa River raised the level at Montreal Harbour

above 6.0 metres for the first month since April. This permitted flows out of Lake Ontario to be relatively low for the month, which led to a slight rise in the lake's level despite below average water supplies to the lake. At the end of December Lake Ontario was 21 centimetres above last year's level and seven centimetres below average.

For the year of 1999, precipitation over the Great Lakes basin was near average, with above average

amounts over Lake Superior's basin and below average amounts over Lake Erie's basin. The first seven months were generally wetter than normal, while the last five months were drier than normal over all areas except Lake Superior.

Air temperatures in eastern Canada during 1999 were the second-warmest on record since 1948, when national record-keeping began. The warmest year was 1998.

December Precipitation Over Great Lakes As a percentage of the long-term December average:

Great Lakes Basin 96% Lake Superior 79% Lakes Michigan-Huron 110%

Lake Erie (including Lake St. Clair)

Lake Ontario 69%

December Outflows From Great Lakes As a percentage of the long-term December average:

Lake Superior Lake Huron

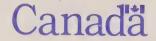
99% 91%

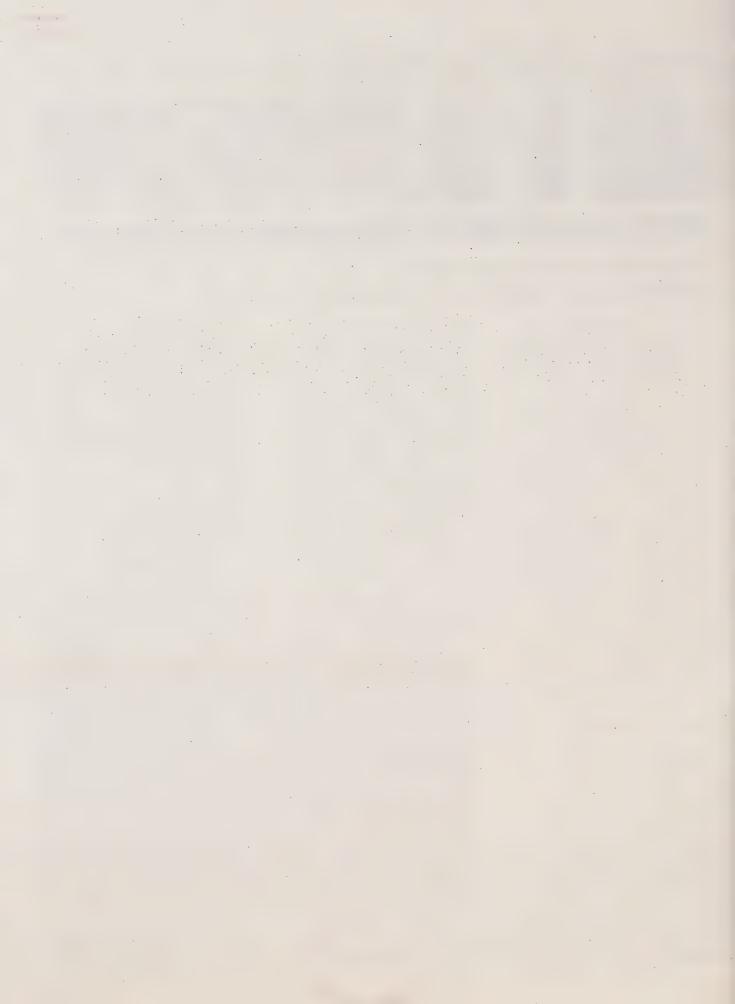
Lake Erie

Lake Ontario 89%









Volume 8, Number 2

February 8, 2000

Dry Conditions Persist Great Lakes Precipitation Below Average in January

While Lake Ontario's basin received slightly more than average precipitation during January, precipitation over the remainder of the Great Lakes basin was below average. Preliminary numbers indicate that the Great Lakes basin received just 82% of its long-term average January precipitation.

Water levels on Lakes Superior, Michigan-Huron and St. Clair continued to decline as they normally do from December through January. During January, Lake Erie declined by a couple of centimetres, whereas, Lake Ontario rose by about the same amount.

A small but sharp drop in the level of Lake St. Clair occurred in late January, due to reduced inflow from Lake Huron caused by ice in the St. Clair River. Ice formation in the St. Lawrence River was a bit quicker than normal this winter, thanks to cold temperatures and low river flows during mid January.

At the beginning of February, Lake Superior was about 21 cm below its seasonal average. Lakes Michigan-Huron were about 46 cm below average, 12 cm below chart datum. Lakes St. Clair. Erie and Ontario were 31, 20 and 12 cm below their seasonal averages,

respectively. Montréal Harbour's level rose slightly during January due to a combination of increased local runoff and the effect of river ice just downstream of Montréal.

Unless supply conditions turn around, the levels of all of the lakes are expected to remain below average over the next six months and may be lower than those experienced in 1999. If wet conditions return to the basin, Lakes Superior, St. Clair, Erie and Ontario could recover to near average levels. Lakes Michigan-Huron; however, would still remain below (continued on next page)

LEVEL*news* on the World Wide Web

Around the 10th of each month, electronic versions of both LEVELnews and the Monthly Water Level Bulletin are posted on the World Wide Web. These publications can be accessed at:

http://www.cciw.ca/glimr/data/level-news/intro.html and,

http://chswww.bur.dfo.ca/danp/wlgraphs.html, respectively.

For additional Great Lakes information be sure to visit the OUR GREAT LAKES site at:

http://www.cciw.ca/glimr/intro-e.html



Environment Environnement Canada





average even if high water supplies are received for the rest of the winter.

1999 in Review

Great Lakes water levels in 1999 were below average as a result of the low water supplies to the lakes which began in 1997 on the upper lakes. The last time levels were this low was in the mid 1960s. Some moderate water level rebounds occurred on Lake Superior and Lake Ontario but they, like the other lakes, remained below average at year end.

Montréal Harbour levels experienced record low levels during the summer months, due to a combination of very low flows from Lake Ontario, the Ottawa River and other local tributaries. Rainfall during the last three months of 1999 raised the harbour's

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are welcome.

Editor, Chuck Southam

Aussi disponible en français

January Precipitation Over Great Lakes

As a percentage of the long-term January average:

Great Lakes Basin 82% Lake Erie 81%
Lake Superior 95% (including Lake St. Clair)
Lakes Michigan-Huron 86% Lake Ontario 102%

NOTE: These figures are preliminary

level closer to seasonal average in December.

Preliminary data show that in 1999 the region experienced its second warmest year on record. The ice season for the winter of 1998-99 was very short, due to mild air temperatures and the absence of severe cold weather systems. The winter of 1999-2000 started out the same way with warm weather and water conditions extending into December 1999. At the end of 1999, the shores of the Great Lakes and the St. Lawrence River remained virtually ice-free.

Problems associated with low water levels in 1999 included reduced hydropower generation, reduced water depths for commercial navigation, unusable recreational boating docks and ramps and reduced channel drafts on the lakes and rivers for all boaters. It is assumed there were additional costs related to water withdrawal for some

domestic and industrial users.

The below-average water levels and absence of storms in 1999 resulted in reduced flood and erosion damage on the shores of the Great Lakes. Occasional low water levels as experienced in 1999 are also considered beneficial in promoting diversity in plants and wildlife in Great Lakes wetlands.

Given the water level conditions at the end of 1999, the risk of serious shoreline flood and erosion damage in 2000 should remain very low.

January Outflows From Great Lakes

As a percentage of the long-term January average:

Lake Superior 97% Lake Erie 97% Lake Huron 90% Lake Ontario 94%

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Volume 8, Number 3

March 8, 2000

Warm Weather Leads to Early Snow Melt **End of February Sees Exceptionally Warm Temperatures**

Exceptionally warm weather over the last few days of February brought precipitation in the form of rain and led to an early snow melt over much of the Great Lakes - St. Lawrence River basin. While the levels on all lakes, except Lake Superior, rose slightly in response to these factors, only Lake Ontario appears to be experiencing a sustained rising trend. Unless this early loss of the basin's snow cover is followed by a exceptionally wet spring, water levels on all lakes will remain well below average this summer.

Lake Superior's level declined steadily throughout

February ending the month 6 cm lower than it was at the start. The lake began March at about the same level as last year, 21 cm below its longterm average and 14 cm below Chart Datum for the lake.

Levels on Lakes Michigan-Huron fell a couple of centimetres during the mid part of February, then recovered at month's end due to basin precipitation and runoff. As a result, the lakes' beginning of March level was virtually the same as that recorded at the beginning of February. The lakes remain about 45 cm below average, 38 cm below last year's level, 12 cm below Chart Datum

and just 30 cm above the record low levels recorded in 1964.

The warm weather also helped ease ice conditions on the St. Clair River allowing inflows from Lake Huron to Lake St. Clair to increase. As a result, Lake St. Clair levels recovered from the small, but sharp, drop that occurred in late January and persisted throughout the first three weeks of February. At the beginning of March, Lake St. Clair remains about 15 cm below average, down 34 cm from last year's level at this time.

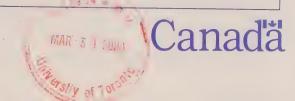
Similar to Lakes Michigan-Huron, the levels of Lakes (continued on next page)

Water Level Advisory

Water levels on Lake Superior and Lakes Michigan-Huron are presently below Chart Datum. Water levels on Lake St. Clair, Lake Erie and on the St. Lawrence River at Montréal are presently above Chart Datum, but considerably below their all-time average for this time of year. The level of Lake Ontario at present is slightly below its all-time average for this time of year. Mariners should exercise extreme caution throughout the entire system, especially on Lake Superior and Lakes Michigan-Huron where water levels are below Chart Datum and may remain so for the next several months.



Environment Environnement



Erie and Ontario also fell a few centimetres over the first three weeks of February only to recover during the last week of the month. Of these lakes, only Lake Ontario appears to be experiencing a sustained rising trend. At the beginning of March, Lake Erie's level was virtually the same as that recorded a month earlier. Lake Erie remains about 23 cm below average, 35 cm below last year's level. Lake Ontario was about 11 cm below average, 6 cm higher than at this time last year.

While water levels in the St. Lawrence River rose somewhat in late February and early March as a result of the snow melt along the St. Lawrence valley, they will decline once runoff conditions diminish. Levels on Lake St. Louis and at Montréal harbour are expected to rise temporarily

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Editor, Chuck Southam

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February Precipitation Over Great Lakes As a percentage of the long-term February average:

Great Lakes Basin 93% Lake Superior 68% Lakes Michigan-Huron 111% Lake Erie 75% (including Lake St. Clair) Lake Ontario 90%

NOTE: These figures are preliminary

once snow melts on the
Ottawa River basin; however,
they are expected to remain
below average thereafter.
Lake St. Lawrence, on the
other hand, should see above
average summer water level
conditions due to the low
flows through the
hydropower dam at
Cornwall/Massena.

Lakes Superior and Ontario Regulation

Lake Superior outflows for the next few months are expected to remain below average and as specified by the lake's regulation plan.

The International St.
Lawrence River Board of
Control continues to maintain
low Lake Ontario outflows.
In order to conserve water on
Lake Ontario, this Board has
authorized that outflows from
the lake be less than specified
by its regulation plan during
the spring if dry conditions
on Lake Ontario continue.

Future Meetings

The International Lake Superior Board of Control has tentatively scheduled its annual public meeting for the evening of Tuesday, June 27, 2000 in Marquette, MI.

The International Niagara
Board of Control has
scheduled its annual meeting
with the public for the
evening of Tuesday,
September 12, 2000 in
Niagara Falls, NY.

The International St.
Lawrence River Board of
Control has tentatively
scheduled its annual public
meeting for Tuesday, May
30, 2000 in Olcott, NY.

Please watch for detailed announcements for these meetings in future editions of LEVELnews.

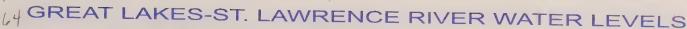
February Outflows From Great Lakes

As a percentage of the long-term February average:

Lake Superior
Lake Huron

92% Lake Erie 96% Lake Ontario

89% 91%





Volume 8, Number 4

Water Levels on all Lakes Rise During March **Dry Basin Conditions May Limit Seasonal Rise**

Water levels on all of the Great Lakes rose during the month of March in response to an early Spring melt. With virtually no snow remaining on much of the Great Lakes basin, signs are that very dry basin conditions will continue into the Summer limiting the seasonal rise on the lakes this year.

The water level on Lake Superior was 5 cm higher at the end of March than it was at the beginning of the

month. However, since levels on the lake fell slightly before starting to climb, March's monthly mean level remained the same as that of February. Lake Superior began April about 6 cm higher than last year, 15 cm below its long-term average and 9 cm below Chart Datum.

Water levels on Lakes Michigan-Huron rose by 2 cm from the beginning to the end of March. The lakes' monthly mean level rose

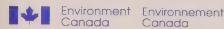
3 cm from February to March. As a result, the lakes remain about 48 cm below average, 32 cm below last year's level and 10 cm below Chart Datum.

Lake St. Clair levels rose just 1 cm during March. On the other hand, the lake's monthly mean level for March was 22 cm higher than that of February. This large difference is due to the fact that Lake St. Clair levels were suppressed during the (continued on next page)

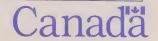
Boaters Beware

Boaters are advised that water levels are well below average and, on some of the Great Lakes, lower than last year. One of the greatest risks this summer is that rocks, shoals and other objects that were covered with sufficient water for safe passage last summer may now catch keels and propellers. Other problems include difficulties launching boats and reduced accessibility while on the lakes and rivers.

All boaters should ensure they have up-to-date navigation charts and know the present water level relative to Chart Datum in their planned boating area. This is particularly important on Lakes Superior and Michigan-Huron where water levels are below Chart Datum and may remain so when the boating season starts. When levels fall below Chart Datum, actual water depths are less than those shown on the charts. Present water levels on the Great Lakes and the St. Lawrence River are available from a network of voice-announcing water level gauging stations operated by the Canadian Hydrographic Service. This month's mailing of LEVELnews and the Monthly Water Level Bulletin includes a pocket-sized card listing the phone numbers for the voice-announcing gauges. This information can also be found on the Canadian Hydrographic Service's web site at: chswww.bur.dfo.ca/danp/tidal.html







first three weeks of February due to ice conditions in the St. Clair River. March's mean level reflects the recovery in water levels that occurred once ice conditions eased late in February. At the beginning of March, Lake St. Clair was 31 cm below average--down 28 cm from last year.

Lakes Erie and Ontario rose by 8 and 15 cm, respectively, during March. Lake Erie began April 29 cm below its long-term average and 32 cm below last year's level at this time. While Lake Ontario also began the month 11 cm below average, it's beginning of month level was 9 cm above that recorded last year.

Recent reductions in the Lake Ontario outflow below those specified by its regulation plan have resulted in about 8 cm of water being

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Editor, Chuck Southam

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March Precipitation Over Great Lakes

As a percentage of the long-term March average:

Great Lakes Basin 79% Lake Superior 123% Lakes Michigan-Huron 70% Lake Erie 66% (including Lake St. Clair) Lake Ontario 64%

NOTE: These figures are preliminary

conserved on Lake Ontario.
Continued outflow reductions during April may not be possible since they would lower the already very low water level conditions downstream on Lakes St. Francis and St. Louis thus affecting Seaway navigation.

Welcome Back Seasonal Subscribers

LEVELnews would like to welcome back its seasonal subscribers one month early this year. Given current water level conditions we wanted to get LEVELnews and the Monthly Water Level Bulletin to you a little earlier this year. As a result, you will receive seven editions of both publications this year.

St. Lawrence Board Holds Multi-City Teleconference

In an effort to find new ways to reach out to the public, the St. Lawrence Board held a highly successful multi-city teleconference on March 22. More than 120 members of

the public participated in the teleconference that connected the Board with Alexandria Bay and Rochester, New York, Cornwall and Toronto, Ontario and Montréal, Quebec. Those attending not only had the opportunity to express local views and concerns, but also hear the views and concerns from other sites.

Remember that the St. Lawrence Board and other IJC Board web sites can be accessed at: http://www.ijc.org.

March Outflows From Great Lakes

As a percentage of the long-term March average:

Lake Superior 91% Lake Huron 94% Lake Erie 92% Lake Ontario 85%



Volume 8, Number 5

May 8, 2000

Water Levels on Lower Lakes Rise in Response to Rain Dry Conditions Continue to Limit Seasonal Rise on Upper Lakes

April brought somewhat wetter conditions to both Lakes Erie and Ontario basins; however, below average conditions continued for Lakes Superior and Michigan-Huron.

Due to below average precipitation and limited Spring runoff the levels of Lakes Superior and Michigan-Huron rose by just 1 and 3 cm, respectively, from the beginning to the end of April. Signs are that the seasonal rise on these lakes

will be less than usual this year.

Lake Superior began May about 2 cm lower than last year, 22 cm below its longterm average and 8 cm below Chart Datum. Lakes Michigan-Huron are now about 55 cm below average, 33 cm below last year's level and 6 cm below Chart Datum. Last month, Lakes Michigan-Huron were 31 cm above the record low April level experienced in 1964.

Lakes St. Clair and Erie levels rose by 14 and 16 cm, respectively, during April in response to rain over their basins. At the beginning of May, Lake St. Clair was 27 cm below average, down 29 cm from last year. Lake Erie began May about 25 cm below its long-term average and 30 cm below last year's level at this time.

Water supplies to Lake Ontario were close to average during April. Recent rainfall (continued on next page)

Swimming Hazard

Last year LEVELnews highlighted a hazard often forgotten when discussing the recent drop in Great Lakes water levels. Since water levels on the middle lakes have continued to decline we would like to repeat the warning to swimmers about the danger they face with water levels down significantly over the past few years.

With the water's edge receding, running off a dock or down the beach for that first dive of the year can result in serious, permanent damage to the head, neck and back. With levels much lower than last year, it is imperative that anyone responsible for children—parents, grandparents and camp counsellors make them aware that the water is not as deep as it has been in the past. There may be little or no water at the ends of docks and the rocks children swam out to last year will be much closer to the surface. Please check water depths for swimming and diving as well as boating so you can continue to enjoy funfilled, accident-free visits to the lakes this year.





on the Lake Ontario basin and on-going below-average Lake Ontario outflows have brought the level of Lake Ontario to average. By releasing outflows less than specified by the lake's regulation plan the International St. Lawrence River Board of Control has conserved 10 cm of water on Lake Ontario. Water levels are expected to remain near average on Lake Ontario throughout the Summer months.

Volume Change

The water levels of the Great Lakes have declined from near record highs in 1997 to current conditions in response to a combination of consistently below-normal precipitation and unusually high temperatures The volume of water in each lake has also declined. For

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Editor, Chuck Southam

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April Precipitation Over Great LakesAs a percentage of the long-term April average:

Great Lakes Basin 108% Lake Superior 85% Lakes Michigan-Huron 97% Lake Erie 132% (including Lake St. Clair) Lake Ontario 149%

NOTE: These figures are preliminary

example, water levels on Lakes Michigan-Huron have fallen 1.27 m from July 1997 to April 2000. With their combined total water surface area of 117 400 km² this 1.27 m decline in levels translates to around a 149 km³ reduction in water volume. The volume of all the Great Lakes combined has decreased by about 231 km³ of water during the same period of time. If all this water were spread out it would cover the total surface area (land and freshwater) of the Province of Ontario to a depth of about 22 cm.

Public Meetings

The International St.
Lawrence River Board of
Control has scheduled its
annual public meeting for the
evening of Tuesday, May 30,
2000 at the Olcott Fire Hall,
1691 Lockport-Olcott Road,
Olcott, NY. The meeting is
scheduled to start at
7:00 p.m.

The International Lake

Superior Board of Control has scheduled its annual public meeting for 7:30 to 9:00 p.m. on Tuesday, June 27, 2000 at the Presque Isle Park pavilion in Marquette, MI.

The International Niagara Board of Control has scheduled its annual meeting with the public for the evening of Tuesday, September 12, 2000 in Niagara Falls, NY. Please watch for details on the time and location of the Niagara Board meeting in future editions of LEVELnews.

April Outflows From Great Lakes

As a percentage of the long-term April average:

Lake Superior 93% Lake Huron 87% Lake Erie 91% Lake Ontario 83%

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GREAT LAKES-ST. LAWRENCE RIVER WATER LEVELS



Volume 8, Number 6

June 8, 2000

May Brings Above Average Rainfall to the Great Lakes Basin St. Lawrence Board Meeting Draws Large Crowd

The wet weather conditions experienced over the lower Great Lakes in April continued during May and spread to the upper lakes. Preliminary data show that rainfall over the Great Lakes basin was about 52% above average in May. Water levels, however, remain below average on each of the Great Lakes except Lake Ontario.

Lake Superior levels rose 6 cm from the beginning to the end of May. At the beginning of June, the lake

remains 25 cm below its long-term average, but has climbed to within a centimetre or two of its Chart Datum.

Lakes Michigan-Huron, St. Clair and Erie rose 12, 9 and 12 cm, respectively, during the same period of time. Lakes Michigan and Huron are now 51 cm below average and 25 cm below last year's level. Recreational boaters should note that Lakes Michigan-Huron levels are now a few centimetres above Chart Datum. Lakes

St. Clair and Erie began June about 20 cm below their long-term averages. Both lakes are currently about 14 cm below last year's levels.

Levels on Lake Ontario rose 24 cm during May in response to above average water supplies. The lake has risen more than one-half metre in the last two months and is now 15 cm above the average for this time of year.

Rainfall during the first half of May also helped to (continued on next page)

St. Lawrence Board Meets with the Public

About 130 people attended the International St. Lawrence River Board of Control's annual public meeting held in Olcott, N.Y. on May 30, 2000. The meeting provided an opportunity for the Board to discuss its current activities related to Lake Ontario regulation, and to hear views and concerns from the public. The meeting also provided an excellent forum where various stakeholders from the Lake Ontario - St. Lawrence River basin spoke and listened to each other about their individual needs and concerns. In addition to their annual public meetings, the Board also keeps stakeholders informed of current water level conditions and Board activities through its web page on the Internet and town-hall meetings attended by Board members. These activities have acted to close the communication gap between the Board and the public. More information on this Board and up-to-date information on Board activities, such as the Lake Ontario outflow strategy, can be found on the Board's web site at: http://www.islrbc.org/

temporarily boost water levels at the Port of Montréal by mid-May. While levels have declined slightly since that time, they were about one metre above Chart Datum at the beginning of June. At this time last year, harbour levels were just at Chart Datum and well below average.

Lake Ontario Regulation

As reported over the past few months, reductions in Lake Ontario outflow below that specified by its regulation plan have resulted in 10 cm of water being conserved on the lake.

On May 30, the International St. Lawrence River Board of Control reaffirmed its regulation strategy previously adopted on April 12, after assessing hydrologic

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Editor, Chuck Southam

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May Precipitation Over Great Lakes As a percentage of the long-term May average:

Great Lakes Basin 152% Lake Superior 124% Lakes Michigan-Huron 164% Lake Erie 156% (including Lake St. Clair) Lake Ontario 148%

NOTE: These figures are preliminary

conditions and taking into consideration the needs and concerns of stake-holders in the Lake Ontario – St. Lawrence River system.

The strategy calls for a gradual elimination of 4 cm of the water stored on Lake Ontario, over the summer beginning June 17. During this period, the Lake Ontario outflow will be 100 cubic metres per second more than specified by the regulation plan. This slight increase in the outflow provides additional water to users downstream of Cornwall, Ontario without accelerating the seasonal decline in Lake Ontario's level during the summer.

The Board also directed that the remaining 6 cm of stored water is to be used to meet critical needs of hydropower on the St. Lawrence River and navigation at the Port of Montreal throughout the fall. Should occasional heatwayes this summer increase

demands for electricity, higher flows at the power dams on the St. Lawrence River are possible to help meet these needs.

Superior Board Public Meeting

The International Lake Superior Board of Control's annual public meeting will be held on Tuesday, June 27, 2000 at the Presque Isle Park pavilion in Marquette, MI. from 7:30 p.m. to 9:00 p.m.

May Outflows From Great Lakes As a percentage of the long-term May average:

Lake Superior 86%
Lake Huron 85%

Lake Erie 91% Lake Ontario 92%

LEU Enews

Volume 8, Number 7

July 7, 2000

June Rainfall Brings Some Relief, But Upper Great Lakes Levels Remain Below Average

Great Lakes water levels rose during June in response to above average rainfall. Lakes Superior, Erie and Ontario levels had much sharper rises during the month compared to Lakes Michigan-Huron. Water levels on all of the Great Lakes, with the exception of Lake Ontario, remain below average.

Compared to their long-term average levels for this time of the year, Lakes Superior is

currently 18 cm below average, Lakes Michigan-Huron 48 cm below average, Lake St. Clair 16 cm below average and Lake Erie about 6 cm below average. Lake Ontario, on the other hand, is currently about 29 cm higher than average, due to abundant rainfall on its basin during the past three months. Increased flows of the St. Lawrence River and the Ottawa River raised water

levels in the Montreal region sufficiently for navigation in June.

Lakes Superior, Michigan-Huron and St. Clair are expected to remain below average for the rest of the summer and early fall. Lake Ontario's level is expected to remain above average, while Lake Erie's level may approach average if wet conditions continue.

(continued on next page)

Rain, Rain...

June was another wet month across Ontario, setting new marks for monthly rainfall totals in several locations, and when combined with the high totals of May, making this one of the wettest starts to summer on record. There was no day that rain did not fall somewhere in the province. On 14 days there was at least one location that had a measurement of more than 25 mm. On eight other occasions rainfall topped 50 mm. The only part of the province to escape the month's excess moisture was found in an area extending along the east side of Georgian Bay to Sudbury and then northeastwards to north of Lake Temiskaming. Rainfall amounts here were 75 to 90% of normal.

The temperature trend during June generally showed a marked departure from that of the latter half of the spring. Throughout almost all of northern Ontario monthly means were one to three degrees below normal. In the southeast they were also below normal, although generally only by a degree or less. Only in an area to the west of a Toronto-Collingwood line and along the northeast shore of Lake Superior were mean temperatures for the month above normal.

Source: Malcolm Geast, Atmospheric Science Division, Meteorological Service of Canada, Ontario Region



Environment Environnement Canada Canada



Extra Caution Needed

While no new record lows are expected this year, recreational boaters on Lakes Superior. Michigan-Huron (including Georgian Bay), St. Clair and Erie do need to exercise extra caution on the water this boating season. Areas that have been safely navigated in previous years may be too shallow this year. The risk of scraping bottom and damaging propellers is much greater than last year.

Lakes Superior and Ontario Regulation

Lake Superior outflows for the next few months are expected to remain below average and as specified by the lake's regulation plan. The regulation plan aims to provide a balance in the water levels of Lake Superior and Lakes Michigan-Huron taking into consideration

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Editor, Chuck Southam

Aussi disponible en français

June Precipitation Over Great Lakes

As a percentage of the long-term June average:

Great Lakes Basin 146% Lake Superior 142% Lakes Michigan-Huron 123% Lake Erie 182% (including Lake St. Clair) Lake Ontario 184%

NOTE: These figures are preliminary

their historical ranges of fluctuation.

In accordance with the International St. Lawrence River Board of Control's strategy to slowly remove some of the water conserved on Lake Ontario earlier in the year, the outflow of Lake Ontario starting mid June was set 100 m³/s more than specified by the lake's regulation plan. In light of the recent rapid rise in the water level of Lake Ontario, the Board has decided to further increase the outflow of Lake Ontario until the level of the lake has passed its seasonal peak for this year. The flow for the first week of July was set 300 m³/s more than specified by Regulation Plan 1958-D. After the lake has passed its peak, the outflow will again be adjusted at 100 m3/s more than specified by the regulation plan.

Superior Board Public Meeting

The International Lake
Superior Board of Control
held its annual public
meeting June 27, 2000 at the
Presque Isle Park pavilion in
Marquette, MI. Those in
attendance expressed their
concerns and views regarding
Lake Superior water levels.

June Outflows From Great Lakes

As a percentage of the long-term June average:

Lake Superior 78%
Lake Huron 91%

Lake Erie 92% Lake Ontario 100%



LEVER PARTIES

Volume 8, Number 8

August 9, 2000

Most Lakes Reach Peak Summer Level Levels of Lower Lakes Move Closer to Average

Water levels on Lakes
Ontario, Erie and St. Clair all
moved closer to their longterm averages during July,
while the levels of Lakes
Huron and Superior increased
by less than their anticipated
amounts and moved further
below their average levels.

The levels of Lakes Superior and Huron fluctuated over a narrow range during the month, and both lakes were at the same level on August 1st as they had been on July 1st. Lakes Erie and Ontario were both at their peak levels early in July, and they gradually declined during the latter part of the month. On August 1st Lake Ontario's level was 17 centimetres lower than one month earlier.

At the beginning of August, Lake Superior was 24 centimetres below average, Lake Huron was 48 centimetres below average, Lake St. Clair was 10 centimetres below average, Lake Erie was 5 centimetres below average, and Lake Ontario was 19 centimetres above average. Lake Huron has not been lower at this time of year since the mid-1960s, although it is still well above its record low.

(continued on next page)

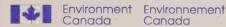
Haul-out date may need to be early

Recreational boaters and marinas are advised that the level of Lake Huron (including Georgian Bay) this fall will likely be the lowest fall level in 35 years. This will lead to less than usual water depth at docks and boat ramps that have not been dredged, which could cause some difficulty in removing boats from the water for winter storage. In some cases it may be necessary to remove boats earlier than usual, particularly if it was necessary to delay launching this spring due to insufficient depth. It is very difficult to accurately predict the rate of decline in the water level this fall, but the level could drop below chart datum as early as October. This spring, the level climbed to chart datum on May 13.

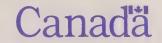
There is a possibility that similar conditions could occur on Lakes St. Clair and Erie. While it is very unlikely that the levels of these two lakes will drop below chart datum this fall, their levels this October could be similar to those of this past April.

On Lake Ontario, levels during the fall should be at or above last year's level for the corresponding period.

In the next edition of LEVEL*news*, the situation will be updated along with a discussion of anticipated conditions in the St. Lawrence River.







Rainfall over the Lakes Erie and Ontario basins during July was above average for the fourth consecutive month, although not as heavy as in the earlier months. Lakes Michigan and Huron also had above average rainfall, with about half the monthly total occurring in the last five days. Meanwhile, Lake Superior's basin received significantly less than average rainfall during July.

Depending on rainfall, the level of Lake Superior is expected to remain relatively constant over the next three months, while Lake Huron's level will decline slowly. The levels of Lakes St. Clair and Erie may decline a bit faster than usual, due to below average supplies of water from Lake Huron. Lake Ontario is expected to decline faster than usual, and be close to its average level

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Editor, Chuck Southam

Aussi disponible en français

July Precipitation Over Great Lakes

As a percentage of the long-term July average:

Great Lakes Basin 111% Lake Superior 78% Lakes Michigan-Huron 131% Lake Erie 114% (including Lake St. Clair) Lake Ontario 108%

NOTE: These figures are preliminary

by October.

During July, Montréal
Harbour's water level was
just three centimetres below
average, and 100 cm above
last July's level. This was the
smallest amount below
average for the harbour's
level since August 1998. It is
anticipated that the Harbour's
level will decline over the
next three months, but it
should remain above chart
datum.

Open House

The International Niagara Board of Control will hold an Open House on Tuesday, September 12, 2000. This session will begin at 7:30 p.m. at the Four Points/Sheraton Hotel, 114 Buffalo Avenue, Niagara Falls, New York. The International Niagara Board of Control is a bi-national organization reporting to and advising the International Joint Commission on matters regarding water levels, flows and similar subjects pertaining to the Niagara River. The

purpose of this Open House is to inform the public of the Board's current activities and to hear public comments and suggestions regarding the Board's work. In addition, information will be presented on Great Lakes' water levels. If you require additional information, please contact Len Falkiner at: (905) 336-4947.

July Outflows From Great Lakes

As a percentage of the long-term July average:

Lake Superior 95% `Lake Huron 82%

Lake Erie 97%
Lake Ontario 111%



Volume 8, Number 9

September 8, 2000

Water Supplies Vary by Lake Basin **Upper Lakes Reach Peak Summer Level**

Water supplies during August were greater than average on the basins of Lakes Erie and Ontario, but were below average on the Lakes Superior and Michigan-Huron basins.

Daily waters levels on Lakes Superior and Michigan-Huron rose slightly during the first half of August, but fell gradually during the later half of the month suggesting that the upper lakes may have reached their seasonal peaks for the year.

Rather than rising slightly as it usually does during August, Lake Superior ended the month 2 cm lower than it was

at the beginning of the month. Lake Superior began September about 27 cm. below its long-term average, about 15 cm below its level of last year.

Although the monthly mean level of Lakes Michigan-Huron remained unchanged from July to August, the lakes declined by a nearaverage amount of 3 cm from the beginning to the end of August. Lakes Michigan-Huron remain about 47 cm below average, about 19 cm below their level of a year ago, but still 35 cm above their record minimum for this time of year.

Water levels on Lakes St. Clair and Erie declined by near-average amounts during August, falling 10 cm and 6 cm, respectively. Lake Ontario's level fell slightly more than average during August, declining 20 cm. At the beginning of September. Lake St. Clair was 13 cm below average, Lake Erie was 3 cm below average, and Lake Ontario was 13 cm above average.

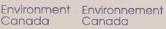
During August, Montréal Harbour's water level was 12 cm below average, 100 cm above last year's level.

(continued on next page)

Boat Haul-Out

With the cooler air temperatures in early September, some recreational boaters have already begun hauling their boats out of the water for the season. Others, however, would prefer to stay on the lakes and rivers a bit longer. Recreational boaters on Lakes Superior, Michigan-Huron and St. Clair should be aware that water levels on these lakes are below average and declining. Water levels on Lakes Superior and Michigan-Huron could fall below chart datum as early as October. Although conditions on Lake Erie, Lake Ontario, or the upper St. Lawrence River are not as problematic, we advise boaters throughout the Great Lakes system to pay close attention to water levels. Low water level conditions may make it more difficult, and perhaps more costly, to haul boats out.







The level of Lake Superior is expected to remain about the same in September while those of the other lakes are expected to decline during the month. The most probable supplies forecast indicates that the Montréal Harbour's monthly mean level will decrease in September and remain below average, but above chart datum.

Lake Superior Activities

Lake Superior outflows are expected to be as specified by the lake's regulation plan for the coming months.

Environment Canada and the U.S. Army Corps of Engineers conducted flow measurements in the St. Marys River during August. These flow measurements are part of a long-term program to improve the rating for the

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Editor, Chuck Southam Aussi disponible en français

August Precipitation Over Great Lakes

As a percentage of the long-term August average:

Lake Erie 106% **Great Lakes Basin** (including Lake St. Clair) 116% Lake Superior Lake Ontario Lakes Michigan-Huron 99%

NOTE: These figures are preliminary

Compensating Works. The rating gives flows corresponding to various gate open patterns at the structure and Lake Superior water levels.

Lake Ontario Activities

The International St. Lawrence River Board of Control will continue to release Lake Ontario outflows as specified by the lake's regulation plan except during certain conditions. Higher outflows using the 6 cm water stored on Lake Ontario are permitted to provide relief to hydropower and navigation that are seriously affected by low water levels and flows in the St. Lawrence River. Earlier this year, the Board had stored some water on Lake Ontario by flowing less than specified by the lake's regulation plan.

On September 7, the St. Lawrence Board held its second public teleconference this year connecting Toronto, Cornwall, Montreal, Rochester and Alexandria Bay. The event provided the public with an opportunity to communicate with the Board on water level issues. It also enabled the various user groups in the Lake Ontario -St. Lawrence River system to listen to, and talk with one another about their particular needs and concerns related to water levels.

94%

August Outflows From Great Lakes

As a percentage of the long-term August average:

97% 91% Lake Erie Lake Superior Lake Ontario 100% 83% Lake Huron

GREAT LAKES-ST. LAWRENCE RIVER WATER LEVELS



Volume 8, Number 10

October 6, 2000

Water Levels Decline on All Lakes Fall Storm Season Begins

Monthly average water levels on all of the Great Lakes declined from August to September. The levels of all lakes are expected to continue to decline throughout the fall and winter.

The dry conditions over the Lake Superior basin that led to the lake's early peak in levels this year continued during September. As a result, the monthly average water level of Lake Superior

declined by 3 cm from August to September. Lake Superior began October about 34 cm below its long-term average which is 2 cm above of the lake's Chart Datum.

The level of Lakes Michigan-Huron declined by a near-average amount from August to September, falling about 4 cm. At the beginning of October, Lakes Michigan-Huron were 47 cm below their long-term average, 17 cm below levels recorded

one year ago and 5 cm above Chart Datum. Lakes Michigan-Huron remain about 33 cm above their period-of-record low level recorded in 1964.

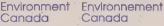
Both Lakes Superior and Michigan-Huron are likely to fall below their respective Chart Datum levels during October. Boaters on these lakes and throughout the entire system should exercise caution especially during (continued on next page)

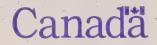
Stormy Season Begins

Fall often brings storms packing high winds to the Great Lakes region. When strong winds continue to blow over a lake in one direction for a number of hours, they produce a surface tilt referred to as 'wind set-up'. At the eastern end of Lake Erie, for example, this wind set-up can cause the water level to rise over two metres on a temporary basis in less than a day. While the continuing below-average water level conditions on Lakes Superior, Michigan-Huron and St. Clair will help reduce the risk of serious flood and erosion damage to shore property due to storms on the upper lakes, the risks are slightly higher on Lakes Erie and Ontario where near-average levels prevail.

No matter what the risk of shore property damage is, readers are reminded to exercise caution when near the water's edge during a storm. Over the years, many people standing too close to the water's edge during a storm event have been seriously injured, even killed, when swept into the lake by a stormgenerated wave.







periods of strong winds when localized water levels can rise or fall significantly in a very short period of time.

Water levels on Lakes St. Clair, Erie and Ontario all declined by more than average from August to September, falling 10, 13 and 25 cm, respectively. Lake St. Clair began October about 18 cm below its long-term average level, just slightly lower than it was at the same time last year. Lake Erie began October 8 cm below average, but was up 4 cm from last year's level. As indicated, Lake Ontario levels declined significantly from August to September. As a result, the lake began October just 2 cm above average.

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Editor, Chuck Southam

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September Precipitation Over Great Lakes

As a percentage of the long-term September average:

Great Lakes Basin 105% Lake Superior 64% Lakes Michigan-Huron 118% Lake Erie 148% (including Lake St. Clair) Lake Ontario 105%

NOTE: These figures are preliminary

Last Edition for Seasonal Subscribers

For those of you who are on our mailing list for the Water Level Bulletin and LEVELnews for the six months from spring to fall only, this is the last edition you will receive this year. You will automatically start receiving both publications again in May 2001. If you would like to check water level conditions between now and then, please feel free to call us at one of the telephone numbers provided in the For More Information box, or contact the Canadian Hydrographic Service at the telephone number shown on the Bulletin. If you prefer, you can access water level and related information through the OUR GREAT LAKES site at: http://www.on.ec.gc.ca/

No Longer Need Water Level Information Year-round?

If you are on the year-round subscription mailing list, but have found that you only read the Water Level Bulletin and LEVELnews from spring to fall, please consider switching to a seasonal subscription. Moving to the seasonal mailing list will help us reduce costs and eliminate waste. If you would like to switch, just let us know.

September Outflows From Great Lakes

As a percentage of the long-term September average:

Lake Superior 81% Lake Huron 84%

glimr/intro-e.html

Lake Erie 95% Lake Ontario 106%

1100

LEVEL news Great Lakes - St. Lawrence River



Volume 8, Number 11

November 9, 2000

Most Lakes Decline by More than Average During October Upper Lakes Fall Below Chart Datum

Water levels on the Great Lakes invariably decline at this time of year, due in the most part to high rates of evaporation caused by a combination of cool, dry air over the relatively warm water of the lakes. This year, however, below average precipitation during October contributed to a greater and more rapid seasonal decline on all lakes except for Lake Erie. Preliminary data show that rainfall over the Great Lakes basin was just 66% of average during October. Only the Lake Erie basin received rainfall within 10% of its monthly average amount.

The monthly mean water level of Lake Superior fell by 8 cm from September to October—more than twice the long-term average decline for this period of time. Lake Superior water levels are again below Chart Datum. The lake began November about 35 cm below its long-term average and just 11 cm above the lake's record low for this time of year which occurred in 1925.

The levels of Lakes Michigan-Huron and St. Clair declined about 4 cm more than average from September to October, falling 11 and 13 cm, respectively. Lakes Michigan-Huron levels also fell below Chart Datum during October.

At the beginning of November, Lakes Michigan-Huron were 52 cm below their long-term average and 7 cm below Chart Datum. The lakes began November about 27 cm above their period-of-record low level which was recorded in 1964.

Lake St. Clair began
November about 20 cm
below its long-term average
level. Although St. Clair
levels are below average, the
current level of the lake is
well above record lows.
(continued on next page)

Water Levels on the Upper Lakes Fall Below Chart Datum

Water levels on Lake Superior and Lakes Michigan-Huron fell below Chart Datum during October and are expected to remain so for at least the next 6 months. Boaters on these lakes and throughout the entire system should exercise caution especially during periods of strong winds when localized water levels can rise or fall significantly relative to the pre-storm level in a very short period of time.

Consistently below-average water level conditions on the upper Great Lakes have forced commercial ships to carry lighter loads. The current seasonal decline in levels will likely lead to further reductions in loads until navigation ceases for the winter in late December or early January. Low water levels can also cause problems for water intakes that were not designed to accommodate current conditions.

On a positive note as we enter the fall and winter storm season, the risk of flooding and storm damage to shoreline properties is very low on Lakes Superior, Michigan-Huron and St. Clair and low to moderate on Lakes Erie and Ontario.



Environnement Canada



Lake Erie was the only lake that declined less than average from September to October. Lake Erie levels fell 9 cm which is 1 cm less than average decline recorded for this time of year. At the beginning of November, Lake Erie was 5 cm below average, but up 6 cm compared to last year's level.

Lake Ontario levels declined significantly from September to October, falling 20 cm. As a result, the lake began November 7 cm below average following five months of above-average water level conditions.

Low St. Lawrence River Levels

Last month's low flows from Lake Ontario and other tributaries to the St. Lawrence River resulted in a new record low October monthly mean water level at

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Editor, Chuck Southam

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October Precipitation Over Great Lakes As a percentage of the long-term October average:

Great Lakes Basin 66% Lake Erie 94%
Lake Superior 80% (including Lake St. Clair)
Lakes Michigan-Huron 55% Lake Ontario 47%

NOTE: These figures are preliminary

the Port of Montréal for the 1967-2000 period of record. There were four days when the levels were below Chart Datum elevation, which is considered by shippers as the minimum necessary for their operations. When faced with insufficient depths, some ships will off-load part of their cargo at downstream ports to be transported by land. Declining water levels on Lake St. Louis and Lake St. Francis have also become a concern for Seaway navigation.

Lakes Superior and Ontario Regulation

Lake Superior's outflow will remain below average in November. The International Lake Superior Board of Control continues to follow the regulation plan, which sets monthly outflows taking into account water level conditions on Lake Superior and Lakes Michigan-Huron.

Lake Ontario's outflows are expected to be slightly below average in November and follow closely the regulation plan. However, flow increases by up to about 4% above plan flow may occur at times throughout the month to provide short-term increases in water levels at the Port of Montréal to assist shipping. The flow increases will draw from the 6 cm of water that the International St. Lawrence River Board of Control conserved on Lake Ontario earlier this year.

October Outflows From the Great Lakes As a percentage of the long-term October average:

Lake Superior 68% Lake Erie 94%
Lake Huron 84% Lake Ontario 100%

Volume 8, Number 12

December 8, 2000

Lake Levels Continue Their Seasonal Decline Major Lake-Effect Snowfall in Fort Erie - Buffalo Area

Water levels on the Great
Lakes continued their
seasonal decline during
November fuelled in a large
part by high rates of
evaporation from the lakes.
The levels of all of the Great
Lakes are expected to
continue to decline during
December.

The levels of all of the Great Lakes remain below average. The levels of Lakes Superior and Michigan-Huron are below Chart Datum and especially low. Lakes Superior and Michigan-Huron are about 16 cm below their levels of one year ago.

Lake Superior began December about 35 cm below its long-term average. The lake remains 8 cm below Chart Datum and just 16 cm above the lake's record low beginning-of-December level which occurred in 1925.

At the beginning of December, Lakes Michigan-Huron were 57 cm below their long-term average and 16 cm below Chart Datum. The lakes began the month 21 cm above their record low beginning-of-December level which was recorded in 1964.

The levels of Lakes St. Clair, Erie and Ontario are within a few centimetres of the levels recorded on these lakes last year. Lake St. Clair began December 21 cm below its long-term average level and 4 cm lower than last year. At

the beginning of December, Lake Erie was 12 cm below average and 2 cm lower than last year. Lake Ontario began the month 7 cm below average, 1 cm above last year's level.

Montréal Harbour's mean level was 5.50 m in November, a new record low for the month for the 1967-99 period. This is the second consecutive month that a new monthly record low for the period after 1967 was set. (Lower monthly mean levels were recorded at Montréal Harbour in the fall of 1964, prior to the major modifications to the navigation channel.) The (continued on next page)

Lake-effect Snowfall

Lake evaporation also led to significant lake-effect snowfalls in traditional snowbelt areas throughout the Great Lakes basin highlighted by a severe lake-effect storm in the Fort Erie, Ontario - Buffalo, New York area where snowfall accumulations up to 80 cm were reported in some areas. In the Buffalo metro area, where about 65 cm of snow fell from 1 to 9 p.m. on Monday, November 20th, thousands of people spent the night in autos and stores and many schoolchildren as well as buses became trapped. It was the most disruptive storm in the Buffalo area since the Blizzard of '77. Further lake-effect snow events can be expected until the waters of the lakes cool sufficiently to help limit evaporation.

monthly level was 105 cm lower than the long-term average level for November (1967-99) and 32 cm lower than last November's level. The water level at the harbour was below Chart Datum for nineteen days during November. The most probable supplies forecast indicates that the harbour's monthly mean level will rise slightly in December, but remain well below average and near Chart Datum.

Lakes Superior and Ontario Regulation

The outflow from Lake Superior for December is set at 1560 m³/s, which is as specified by the lake's regulation plan and the same as the past two months.

The low water levels in the

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Editor, Chuck Southam

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November Precipitation Over Great Lakes As a percentage of the long-term November average:

Great Lakes Basin 103% Lake Superior 98% (iii)
Lakes Michigan-Huron 111% Lakes

Lake Erie 83% (including Lake St. Clair) Lake Ontario 100%

NOTE: These figures are preliminary

St. Lawrence River continue to be a concern for commercial navigation. To assist ships entering the Port of Montréal, the International St. Lawrence River Board of Control on several occasions temporarily set the Lake Ontario outflow at 200 to 300 m³/s more than specified by the lake's regulation plan during November.

Lake Ontario's regulation plan is expected to specify below average outflows for December. Depending on downstream water level conditions and navigation needs, flows more than specified by the regulation plan may occur at times during the month. The flow increases will continue to draw from the 6 cm of water that the Board had conserved on Lake Ontario earlier this year.

November Outflows From the Great Lakes As a percentage of the long-term November average:

Lake Superior 69% Lake Huron 85% Lake Erie 95% Lake Ontario 94%

Great Lakes - St.



Lawrence River

Water

Volume 9, Number 1

January 8, 2001

December Storm Causes a 3.9 m Tilt in the Surface of Lake Erie **IJC Establishes Study Board**

On December 11 and 12 a major winter storm belted Southern and Central Ontario, dumping 20-30 cm of snow in the Toronto area and as much as 50-70 cm in the Orillia area.

The storm also had a significant affect on shortterm water levels on Lake Erie. Sustained southwest winds in the 60 knot range pushed the water to the eastern end of the lake causing lake levels to rise, or set-up, above pre-storm

levels by 2.8 m at Buffalo, NY and 2.1 m at Port Colborne, ON. As levels rose at the eastern end of the lake, there was a corresponding drop, or set-down, in water levels at the western end of the lake. At Toledo, OH and Bar Point, ON, levels fell about 1.3 m and 1.0 m below prestorm levels, respectively. At one point during the storm, the difference between water levels recorded at opposite ends of the lake was more than 3.9 m.

The storm set-up at the eastern end of the lake was one of the largest on record, but fortunately lasted only two hours and occurred at a time of below average Lake Erie static levels. Flooding of roads and a park were reported in Ontario, while damages to and evacuation of some houses occurred near Buffalo. Although the magnitude of the set-down at the western end of the lake was much smaller than the set-up at the eastern end, the (continued on next page)

IJC establishes International Lake Ontario-St. Lawrence River Study Board

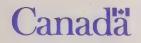
On December 18, 2000, the International Joint Commission (IJC) announced the establishment of an International Lake Ontario-St. Lawrence River Study Board. The Study Board will have seven U.S. and seven Canadian members. Lynn Cleary and Doug Cuthbert of Environment Canada have been appointed to the Study Board.

Over the next few years, the Study Board will undertake the work needed to evaluate options for regulating levels and flows in the Lake Ontario-St. Lawrence River system. The Study Board will carry out its work independent of the work of the International St. Lawrence River Board of Control, which is responsible for overseeing the regulation of the outflows from Lake Ontario.

It has been nearly 50 years since an assessment was performed of water levels and flows regulation in the Lake Ontario-St. Lawrence River system. In April 1999, the IJC informed the Governments of the United States and Canada that it was becoming increasingly urgent to review the regulation of Lake Ontario outflows in view of dissatisfaction on the part of some interests and in light of environmental concerns and climate change issues. Formation of the Study Board is the result of both Governments allocating funds for the multi-year study.







set-down lasted much longer, posing a potential hazard for commercial navigation.

Water Level Update

The levels on all of the Great Lakes remain below average. At the beginning of January, the levels of Lakes Superior, Michigan-Huron, Erie and Ontario were 37, 59, 18 and 4 cm below their seasonal averages, respectively.

The first cold front entered the Great Lakes region in early December. By midmonth, ice covers were forming in parts of the St. Lawrence River. The broken ice caused extensive delays for ships that used the locks between Lake Ontario and Montréal. On December 26, the 2000 Seaway navigation season ended when the last vessel exited the system.

FOR MORE INFORMATION:

Raiph Moulton, Manager Great Lakes-St. Lawrence Water Level Information Office P.O. Box 5050 Burlington, ON L7R 4A6 Tel. (905) 336-4580 FAX: (905)336-8901 E-mail: water.levels@ec.gc.ca http://www.cciw.ca/glimr/

Peter Yee Great Lakes-St. Lawrence Regulation Office 111 Water Street East Cornwall, ON K6H 6S2 Tel. (613) 938-5725 E-mail: peter_yee@pch.gc.ca

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Editor, Chuck Southam

Aussi disponible en français

December Precipitation Over Great Lakes As a percentage of the long-term December average:

Great Lakes Basin 105%
Lake Superior 69%
Lakes Michigan-Huron 116%

Lake Erie 131% (including Lake St. Clair) Lake Ontario 103%

NOTE: These figures are preliminary

Lake Ontario Outflow Strategy

Last spring, the International St. Lawrence River Board of Control announced that it would conserve 10 cm of water on Lake Ontario in light of low upstream water levels. This was completed in May by releasing less water than called for by the lake's outflow regulation plan. The Board then announced that it would use this water for critical needs during the summer and fall. As of mid-December, 4.3 cm of this storage remained.

The Board met by conference call on December 12, 2000 to consider current and potential future water level conditions and establish an appropriate regulation strategy for Lake Ontario. In light of their assessment, and the fact that conditions at the time of their discussions were much dryer than the previous year at the same time, the Board announced the following regulation strategy for the

winter: Lake Ontario outflows will generally be as specified by Plan 1958-D. Some of the stored water may be used to meet critical needs for navigation. If opportunities arise, up to an additional 5 cm of water will be conserved on Lake Ontario. Both this strategy and weather conditions will be continuously monitored and reviewed by the Board.

December Outflows From the Great Lakes As a percentage of the long-term December average:

Lake Superior 76% Lake Huron 82% Lake Erie 95% Lake Ontario 90%

EVELnews



Volume 9, Number 2

February 8, 2001



somewhere within the probable ranges provided, low water level conditions will continue to cause concern for Great Lakes-St. Lawrence River basin interests for the foreseeable future.

Lakes Superior and Ontario Regulation

The regulation plan for Lake Superior continues to specify very low outflows in response to the very low water level conditions on that lake.

Lake Ontario outflows during February are also expected to be those specified by the lake's regulation plan. Ice cover formation in the critical areas of the St. Lawrence River both upstream and downstream of Cornwall was essentially complete by January 22nd.

FOR MORE INFORMATION:

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Editor, Chuck Southam Aussi disponible en français

January Precipitation Over the Great Lakes As a percentage of the long-term January average:

Lake Erie 78% **Great Lakes Basin** (including Lake St. Clair) 86% Lake Superior Lake Ontario 68% Lakes Michigan-Huron 78%

NOTE: These figures are preliminary

Year 2000 in Review (continued from page 1)

Problems associated with the low water levels experienced in 2000 included belowaverage hydropower generation at plants located on the St. Marys, Niagara and St. Lawrence rivers, reduced water depths for commercial navigation and unusable recreational boating facilities. Shallow shore-wells were affected and there were additional operating costs related to water withdrawal for some domestic and industrial users.

There were no reports of serious flood and erosion damage on the shores of the Great Lakes and the St. Lawrence River during the year. A major storm did occur on December 11th and 12th with sustained southwest winds in the 60 knot range over Lake Erie. The resulting storm surge at the eastern end of the lake was one of the largest on record, but fortunately lasted only two

hours and occurred at a time of below-average static water levels.

76%

The regulation plan for Lake Superior performed as designed to help balance the water level conditions upstream on Lake Superior and downstream on Lakes Michigan-Huron.

There were some deviations from the Lake Ontario regulation plan during the year. Lake Ontario outflows were reduced to less than specified by the plan during the spring and thus some water was conserved on Lake Ontario. The stored water was used during the fall to provide relief from the low water level conditions at Montréal Harbour.

January Outflows From the Great Lakes As a percentage of the long-term January average:

Lake Superior 80% 92% Lake Huron

92% Lake Erie 94% Lake Ontario

Great Lakes - St. Lawrence River



Volume 9, Number 3

March 8, 2001

February Brings Two Significant Warm-Weather Episodes Levels on Lower Lakes Rise in Response to Rain and Runoff

February weather conditions over much of Ontario were dominated by two episodes of exceptionally warm weather followed by more seasonal temperatures. Water levels on Lakes St. Clair, Erie and Ontario increased during the month in response to the associated rain and runoff.

The first episode was on the 8th and 9th from Windsor to the eastern end of Lake Ontario, and only on the 9th elsewhere in the Province. Temperatures at Windsor hit 9°C on the 8th and 12°C on the 9th. On the 9th, the warm air extended a little to the north of Lake Nipissing. Temperatures hit 5°C at North Bay; however, they stayed below the freezing mark at Sudbury. To the east, Ottawa hit 7°C on both the 9th and early on the 10th. Temperatures, however, fell rapidly to well below zero as a cold front moved across the Province. Rainfall amounts were fairly substantial, anywhere from 10 to 40 mm. Several areas also had a good snowfall before the warm air made its way in. Snowfall

amounts of 20 to 25 cm were common along the north shore of Lake Ontario on the 8th. Most of that snow melted in the rain and warm temperatures that followed. This warm spell also melted any snow that was on the ground in the western Lake Erie area.

The second episode occurred on the 24th and 25th of the month. The warm weather extended somewhat farther north and west. Timmins managed to hit 4°C, and had five hours of rain with snow and freezing rain shortly beforehand, and snow directly afterward. Sault Ste. Marie also hit 4°C, and Chapleau got up to 3°C. At

the Sault, the rain lasted for almost ten hours and was preceded and followed by freezing rain and snow. In the south it was somewhat. warmer, but preceded by some significant freezing rain during the evening of the 24th and the morning of the 25th. Temperatures hit double digits at many locations on the 25th. Highs of 11.3°C at Windsor, 13.1°C at Mount Hope, 13.8°C at Pearson Airport and 14.4°C at St. Catharines we reported. Even Wiarton and Muskoka reached 9°C. The 1 or 2 cm of snow that was still on the ground at the eastern end of Lake Erie finally disappeared on the 25th.

(continued on next page)

Please be Cautious

Although the shore ice that extends along much of the Great Lakes shoreline can be an awe inspiring site, readers are reminded that walking out on this ice can pose a significant danger. Although the ice the may look solid, and in fact may be fairly thick, large voids and eroded pockets may exist, particularly near the water's edge. Large areas may collapse under your weight or due to wave activity causing you to fall into freezing cold water with a limited chance of rescue. Please resist the temptation to venture too far out on the icy shores of the Great Lakes.



Environnement Canada



Water Level Response

Water levels on the lakes responded to the warm weather episodes to varying degrees. Lake Superior water levels were relatively unaffected by the first episode, but did increase slightly after the second one. Lake Michigan-Huron levels increased slightly after both. As a result, Lake Superior began March about 4 cm lower than it was at the beginning of February. Lake Michigan-Huron levels began March about 4 cm high than it was one month earlier. At the beginning of March, Lakes Superior and Michigan-Huron were about 35 and 53 cm below their long-term averages, respectively.

The rain, melting snow and frozen ground all contributed to increased runoff to Lakes St. Clair, Erie and Ontario.

FOR MORE INFORMATION:

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Editor, Chuck Southam Aussi disponible en français

February Precipitation Over the Great Lakes As a percentage of the long-term February average:

Lake Erie **Great Lakes Basin** 136% (including Lake St. Clair) Lake Superior 133% Lake Ontario 111% Lakes Michigan-Huron 157%

NOTE: These figures are preliminary

Lake St. Clair showed the strongest response. The lake rose by 27 cm from the 8th to the 10th. By the 23rd, however, the lake's level had fallen by 24 cm returning the lake to near pre-event conditions. Lakes Erie and Ontario levels responded more gradually, increasing by 11 and 8 cm, respectively, during the week following the event. The lower lakes did not respond as significantly to the second warm-weather episode. The earlier loss of snow cover combined with evaporation caused by the strong, warm winds likely limited runoff.

Overall, daily water levels on Lakes St. Clair, Erie and Ontario rose 12, 14 and 10 cm, respectively, from the beginning to the end of February. At the beginning of March, the three lakes were 9, 11 and 1 cm below average, respectively.

Snow Cover

At the beginning of March, there were still a few places in southern Ontario with some significant snow still on the ground. London had a trace, Sarnia had 2 cm and Waterloo had 4 cm of snow. Locations with higher values were Wiarton with 16 cm, Peterborough with 20 cm, Cornwall with 22 cm, Mount Forest with 36 cm, Huntsville with 45 cm, Muskoka with 49 cm and Shanty Bay with 73 cm. Further north, North Bay had 89 cm, Sudbury had 39 cm, Thunder Bay had 52 cm and Sault Ste. Marie had 70 cm of snow on the ground.

108%

(LEVELnews would like to acknowledge Mr. M. Geast, Atmospheric Science Division, Meteorological Service of Canada -Ontario Region, for providing much of the information used in this month's edition.)

February Outflows From the Great Lakes As a percentage of the long-term February average:

Lake Superior Lake Erie 96% 80% Lake Huron Lake Ontario 93% 94%

Great Lakes - St. Lawrence River Water



Volume 9, Number 4

160

April 6, 2001

Water Supplies Below Average During March Lake Erie Ice Boom Removal Delayed Past April 1

Water supplies to all of the Great Lakes were below average during March. Water supplies to Lakes Michigan-Huron were particularly low.

The water levels of all of the Great Lakes remain below average. The levels of Lakes Superior and Michigan-Huron are below Chart Datum and are about 21 and 12 cm below their levels of one year ago, respectively. While also below average, levels on Lakes St. Clair, Erie and Ontario began April about 2, 11 and 5 cm higher than last year, respectively.

Lake Superior levels continued to decline as they usually do during March.
Lake Superior began April about 37 cm below its long-term average. The lake was about 31 cm below Chart Datum and just 17 cm above the lake's 1926 record low for the beginning of April.

The monthly mean level of Lakes Michigan-Huron stayed the same from February to March rather than rising as it usually does. At the beginning of April, Lakes Michigan-Huron were 60 cm below their long-term average and 22 cm below Chart Datum. Lakes Michigan-Huron have not been lower at this time of year since the mid-1960s, although they are still 21 cm above their record low of 1964.

Daily levels on Lake St. Clair fluctuated throughout the month of March. The lake's monthly mean level increased by 1 cm from February to March. Lake St. Clair began April about 30 cm below average.

(continued on next page)

Ice Conditions Delay Removal of Lake Erie Ice Boom Past April 1

Ice cover conditions on the eastern end of Lake Erie and the amount of ice below Niagara Falls, delayed the removal of the Lake Erie Ice Boom beyond April 1. At the end of March, about 3160 square kilometres of ice cover remained on the eastern basin. In addition, there was an ice bridge (or jam) in the Maid-of-the-Mist Pool located below Niagara Falls.

The current International Joint Commission Order of Approval governing the operation of the ice boom requires that all floating sections of the boom be opened by the first day of April unless there is more than 650 square kilometres of ice in eastern Lake Erie. Other factors such as the quality of ice, ice build-up in the river above and below Niagara Falls or in the lower Niagara River, or unfavourable weather predictions must also be considered.

Representatives of the International Niagara Board of Control will continue to monitor the ice conditions to determine when boom opening can commence. The earliest ice boom opening was on March 5, 1998 and the latest was May 3, 1971. Last year, removal began on March 23.







Daily levels on Lake Erie increased 7 cm during March—about one-half the average amount. Daily levels on Lake Ontario increased 12 cm during the month, just 3 cm less than average. Due to gains made late in February, however, both lakes experienced month-to-month increases 2 cm higher than average from February to March. At the beginning of April, Lakes Erie and Ontario were 17 and 4 cm below average, respectively.

Montreal Harbour's mean level was 5.99 m in March, 109 cm lower than the 1967-2000 long-term average for March, and a new record low monthly mean level for the month.

FOR MORE INFORMATION:

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Editor, Chuck Southam Aussi disponible en français

March Precipitation Over the Great Lakes As a percentage of the long-term March average:

Great Lakes Basin 61% Lake Erie 62%
Lake Superior 54% (including Lake St. Clair)
Lakes Michigan-Huron 46% Lake Ontario 121%

NOTE: These figures are preliminary

Water Level Outlook

The levels of all of the Great Lakes are expected to begin or continue their seasonal rise during April. A significant snowpack remains on the Lake Superior basin and the northern and eastern portions of the Lakes Huron and Ontario basins. The anticipated runoff from snowmelt should help fuel the seasonal rise on these lakes. However, if low total water supply conditions should prevail, levels on all lakes, with the exception of Ontario, could remain about the same or even decline during April. For example, while levels on Lake Erie have increased for the past two months as a result of an early snowmelt over much of its basin, the lake's seasonal rise may stall once runoff conditions diminish. Please refer to the Monthly Water Levels Bulletin for the forecast of the probable range of water levels on each lake for the next six months.

St. Lawrence Board Holds Multi-City Teleconference

The International St. Lawrence River Board of Control held a highly successful multi-city teleconference on March 20. More than 80 members of the public participated in the teleconference that connected the Board with Alexandria Bay and Rochester, New York, Cornwall and Toronto, Ontario and Montréal, Quebec. Those attending not only had the opportunity to express local views and concerns, but also hear the views and concerns from other sites.

Remember that the St.
Lawrence Board and other
IJC Board web sites can be
accessed at:
http://www.ijc.org.

March Outflows From the Great Lakes As a percentage of the long-term March average:

Lake Superior 80%
Lake Huron 87%

Lake Erie 97% Lake Ontario 96%



LEVEL news Great Lakes - St. Lawrence River Water



Volume 9, Number 5

May 9, 2001

Big Jump in Lake Superior's Level Low Water Levels Expected on Middle Lakes

April was an unusual month, with average to dry conditions over most of the Great Lakes basin, but extremely wet conditions over Lake Superior's basin.

Heavy rainfall combined with snowmelt to cause a dramatic rise in Lake Superior's water level. Prior to April it appeared that levels this spring and summer on Lake Superior would almost certainly be down from last year. However, it now appears that the lake's levels this summer will be at or slightly above those of last summer.

The heavy rainfall was confined to Lake Superior's basin. Lakes Michigan and Huron received near-average precipitation during April, and the level of the lakes rose only slightly more than average during the month. However, the level continues to be below that of last year, below Chart Datum, and at the lowest level for this time of year since 1965.

While heavy precipitation over the spring and summer will push the levels of Lakes Michigan and Huron above those of last summer, average precipitation will likely result in the water levels being 5 to 10 centimetres below last summer and very close to Chart Datum. However, if conditions are hot and dry, Lakes Michigan-Huron could be approaching record low levels by October.

The levels of Lakes St. Clair and Erie increased less than usual during April, and unless we have a wet spring and summer they are not likely to rise significantly from their present level. While at present they are both close to their level of last year at this time, by July they (continued on next page)

Record Rainfall Over Lake Superior Basin

It was a wet month around Lake Superior. Rainfall during April over the lake's basin was 135 millimetres, beating the old record of 106 millimetres by a wide margin (based on preliminary data). In fact, rainfall during April exceeded the total precipitation for the previous three months. It was particularly wet at Thunder Bay, which received over four times the average rainfall for the month.

Not surprisingly, all the rain caused a rapid jump in the lake's water level. For the past century, the largest increase in the lake's level from the beginning of April to the beginning of May was 18 centimetres. This year, the increase was 29 centimetres, which is virtually equivalent to the average rise in level from winter low to summer high! The rainfall got assistance in raising lake levels from melting of the large supply of snow that was around the basin.

As a result of the increase in Lake Superior's level, the outflow from the lake during May will be 30 percent higher that during April.







could be about 25 centimetres below last July's level if we get average precipitation and temperatures.

Lake Ontario's level increased by a typical amount during April, and it is now 5 centimetres below average. It is anticipated that the water level will remain within 15 centimetres of average through the spring and summer.

Rapid Changes in Water Levels at Montréal

For five of the preceding six months, the water levels at Montréal harbour have set new record lows. The level at Montréal remained low for the first week of April. Then, snowmelt on the southern portion of the Ottawa River basin around

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Editor, Chuck Southam

Aussi disponible en français

April Precipitation Over the Great Lakes As a percentage of the long-term April average:

Great Lakes Basin 127%
Lake Superior 271%
Lakes Michigan-Huron 106%

Lake Erie 81% (including Lake St. Clair) Lake Ontario 40%

NOTE: These figures are preliminary

Easter weekend quickly increased the flows to the Montréal region of the St. Lawrence River. By mid-April, the level on Lake St. Louis had risen to near flood stage, and the level at Montréal harbour was 2.2 metres higher than at the beginning of April. This rapid rise was very shortlived, as the harbour level declined by 1.1 metres over the next two weeks.

To minimize the risk of flooding in the Montréal region of the St. Lawrence River, for one day (April 14) the International St. Lawrence River Board of Control held the Lake Ontario outflow at an amount slightly less than specified by the regulation plan. While the flow of the Ottawa River remained high for several days as a result of snowmelt on the northern part of its basin, no further reductions in the Lake Ontario's outflow were needed during the rest of April.

Public Meeting

The International Lake Superior Board of Control will hold its annual meeting with the public on June 27 from 7 p.m. to 9 p.m. at the Inn at Christie's Mill, Port Severn, Ontario. This Board oversees operation of the structure that controls the outflow from Lake Superior to Lake Huron.

April Outflows From the Great Lakes As a percentage of the long-term April average:

Lake Superior 78% Lake Huron 84% Lake Erie 93% Lake Ontario 92%

LEVEL news Great Lakes - St. Lawrence River



Volume 9, Number 6

June 8, 2001

Governor &

Above-average Precipitation Helps Maintain Seasonal Rise in Water Levels

The month of May ended cool and wet across much of the Great Lakes basin.

Preliminary data indicates that the Great Lakes basin received above average precipitation during May.

The wet weather helped resume the seasonal rise in water levels which seemed to stall part way through the month. Daily levels on all lakes actually declined by one or two centimetres at some point during the month before increasing again in response to rainfall.

The water levels of all of the Great Lakes remain below average. Lake Superior began June about 13 cm below its long-term average levels for this time of the

year, but 12 cm above its levels of last year at the same time. Lakes Michigan-Huron remain about 54 cm below average, down 4 cm from last year. Lakes Michigan-Huron began June just above Chart Datum. Lakes St. Clair and Erie started June 28 and 22 cm below average, respectively, while Lake Ontario remains just 9 cm below average.

Montréal Harbour's monthly mean water level was 6.00 m in May, about 130 cm lower than the 1967-2000 long-term average for the month and 66 cm lower than last year.

On May 29th, the gates of the Iroquois Dam were partially closed to suppress the very high water levels on Lake

St. Lawrence. Recreational boaters who wish to transit the St. Lawrence River at Iroquois must use the Iroquois Lock.

As indicated in the Water Level Bulletin, water levels on all lakes, except Lake Ontario, are expected to continue below average throughout the six-month forecast period shown. Lake Ontario's level may move above average starting in June or July.

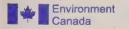
Public Meetings

The International St.
Lawrence River Board of
Control has scheduled its
annual public meeting for the
evening of June 19th at the
Holiday Inn, 1 Princess St.,
Kingston, Ontario. The
meeting is scheduled to start
at 7:00 p.m.

The International Lake Superior Board of Control will hold its annual meeting with the public on June 27th from 7 p.m. to 9 p.m. at the Inn at Christie's Mill, Port Severn, Ontario.

Be Up-to-date

With low water level conditions continuing, recreational boaters on the Great Lakes, connecting channels and St. Lawrence River should keep informed of current conditions before setting out. Be sure you have upto-date navigation charts and know how water levels compare to Chart Datum wherever and whenever you cruise or sail. Present water levels on the Great Lakes and St. Lawrence River are available by telephone from a network of gauging stations operated by the Canadian Hydrographic Service. Additional information about this service is provided on the back page.



Environnement Canada **Canadä**

Accessing Water Level Data by Telephone

Present water levels on the Great Lakes and St. Lawrence River are available from a network of gauging stations operated by the Canadian Hydrographic Service. Phone numbers for the stations are listed below. When you call a particular station, the answering equipment will ask you to press 1 for English or 2 for French, on the keypad of your touch-tone phone. If you do not have a touch-tone phone, the message will start after a few seconds delay. The present water level is given in metres relative to chart datum at that station. Next the message gives the high and low water levels recorded during the previous 12 hours, followed by the elevation of chart datum. You can press 1 or 2 at any time during the message to have it start again, or press 0 to end the call.

FOR MORE INFORMATION:

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Editor, Chuck Southam Aussi disponible en français

May Precipitation Over the Great Lakes As a percentage of the long-term May average:

Great Lakes Basin 131% Lake Erie 124%
Lake Superior 102% (including Lake St. Clair)
Lakes Michigan-Huron 154% Lake Ontario 102%

NOTE: These figures are preliminary

	at Thunder Bay at Rossport at Michipicoten at Gros Cap above the lock below the lock at Thessalon at Little Current at Parry Sound at Collingwood at Tobermory at Goderich at Point Edward at Port Lambton at Belle River at Amherstburg at Bar Point at Kingsville at Erieau at Port Stanley at Port Dover at Port Colborne at Port Weller at Burlington at Toronto at Cobourg at Kingston er at Brockville at Iroquois above lock at Morrisburg at Cornwall at Summerstown	(807) 344-3141 (807) 824-2250 (705) 856-0077 (705) 779-2052 (705) 949-2066 (705) 254-7989 (705) 842-2215 (705) 368-3695 (705) 746-6544 (705) 445-8737 (519) 596-2085 (519) 524-8058 (519) 344-0263 (519) 677-4092 (519) 728-2882 (519) 736-4357 (519) 736-7488 (519) 736-7488 (519) 733-4417 (519) 676-1915 (519) 782-3866 (519) 583-2259 (905) 835-2501 (905) 646-9568 (905) 544-5610 (416) 868-6026 (905) 372-6214 (613) 544-9264 (613) 652-4426 (613) 652-4426 (613) 652-4839 (613) 930-9373 (613) 931-2089
Lake Ontario St. Lawrence Rive		

Call (905) 336-4844, fax: (905) 336-8916 or e-mail: solvasonr@dfo-mpo.gc.ca to report any problems or to obtain additional information.*

May Outflows From the Great Lakes

As a percentage of the long-term *May average:

Lake Superior 93% Lake Erie 87% Lake Huron 84% Lake Ontario 91%

LEVEL news Great Lakes - St. Lawrence River



Volume 9, Number 7

July 9, 2001

Lower Lakes Expected to Start Their Seasonal Decline Lake Superior and St. Lawrence Boards Meet with the Public

Although water levels rose several centimetres during June on Lakes Superior, Michigan-Huron and St. Clair, their seasonal rises have started to ease and only small increases in levels are expected before these lakes begin their annual seasonal decline.

During June, Lakes Erie and Ontario water levels were fairly constant and these two lakes may have reached their annual peaks for the year. Levels on both lakes are likely to decline during July.

Lake Superior began July about 15 cm below its longterm average level for this time of the year. Lakes Michigan-Huron remain about 53 cm below average, but about 8 cm above Chart Datum. Lakes St. Clair and Erie started July below average by 27 and 25 cm, respectively, while Lake Ontario was just 4 cm below average. Montréal Harbour's monthly mean water level was 5.56 m in June, about 120 cm lower than the 1967-2000 long-term average for the month.

Public Meetings Held

The International Lake Superior Board of Control held its annual public meeting in Port Severn. Ontario on June 27th. Close to 30 people attended the evening meeting. Earlier in the day, the Board met with the Georgian Bay Association whose mission statement is to work to ensure the careful stewardship of the greater Georgian Bay environment and to promote the quiet enjoyment of its diverse and finite spaces.

(continued on next page)

Lake Superior Regulation Review

In 1914, the IJC approved completion of hydropower development and the construction of a control structure in the St. Marys River at Sault Ste. Marie. The IJC's 1914 Order lists criteria and requirements governing the construction and operation of these works. It also established the International Lake Superior Board of Control to oversee Lake Superior outflow regulation. The IJC's 1914 Order has been amended several times. The last major revision was in 1979.

To determine if the regulation criteria are consistent with the current users, needs, and interests in the system, the IJC has decided to proceed with the development of a detailed plan of study to review the regulation of Lake Superior outflows. The IJC conducted three public meetings in June (including one on June 27th which coincided with the Lake Superior Board's public meeting) to solicit views and input from the public. Two more meetings are scheduled for early July. Information on this IJC initiative can be found on the IJC web site at: www.ijc.org. Written comments may be provided to the Secretaries of the IJC until July 27, 2001.







At the public meeting, the Board heard concerns about the continuing low water level conditions and their impacts on property owners, boaters and marinas as well as the impact of dredging activities on water quality.

About 40 people attended the International St. Lawrence River Board of Control's annual public meeting held in Kingston, Ontario on June 19th. The participants, representing many user groups (riparian, recreational boating, hydropower generation, commercial navigation, etc.) came from Lake Ontario and from along the St. Lawrence River from Kingston to as far away as Montréal. The meeting provided an opportunity for the Board and the participants to exchange information and

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Editor, Chuck Southam

Aussi disponible en français

June Precipitation Over the Great Lakes As a percentage of the long-term June average:

Great Lakes Basin 93% Lake Superior 86% Lakes Michigan-Huron 102% Lake Erie 92% (including Lake St. Clair) Lake Ontario 77%

NOTE: These figures are preliminary

views on the subject of water levels. More information on this Board and up-to-date information on Board activities, such as the Lake Ontario outflow strategy, can be found on the St. Lawrence Board's web site at: www.islrbc.org/

Lake Ontario Regulation

Water levels in the St. Lawrence River, including those at the Port of Montréal and on Lake St. Louis, have declined considerably during the past few weeks. The very low water level conditions there are not expected to improve. To provide relief to users in the Montréal region affected by the low water levels, the International St. Lawrence River Board of Control has decided to release some of the water it previously conserved on Lake Ontario. Beginning June 23rd, Lake Ontario outflows have been, at times when needed, slightly more than specified by the

regulation plan to prevent very low water levels on Lake St. Louis. The Board's regulation strategy also permits short-term flow increases to meet critical hydropower or navigation needs. At the beginning of July, 6.6 cm of conserved water remained on Lake Ontario.

June Outflows From the Great Lakes As a percentage of the long-term June average:

Lake Superior 96% Lake Huron 86% Lake Erie 88% Lake Ontario 83%



Great Lakes - St. Lawrence River V



Volume 9, Number 8

August 8, 2001

Lake Superior Levels Expected to Peak Soon Three Public Events Scheduled During September

Lake Superior rose by about half its usual amount from June to July. If average weather prevails, Lake Superior will peak for the year sometime in August or September and then begin its annual seasonal decline.

Declining water levels during July on the other Great Lakes–Michigan-Huron, Erie and Ontario–suggest that water levels on these lakes have peaked for the year. Assuming average water supplies, the seasonal decline in water levels should continue over the next few months.

Montréal Harbour's monthly mean water level was 5.40 m in July. This was 1.15 m below the 1967-2000 average value for the month of July, and it is also a new record low for the month. Levels are expected to remain well below average in August.

On July 26th all gates at the Iroquois Dam were raised to their normal fully-open position as the risk of very high Lake St. Lawrence water levels had diminished. With two of the gates raised well above the water line, some recreational boaters transit the St. Lawrence River at

Iroquois by passing through these two gates at the dam instead of using the Iroquois Lock.

Upcoming Public Events

The International Lake
Ontario - St. Lawrence River
Study Board will be holding
its first annual public meeting
on September 13th, 2001, at
the Delta Centre-Ville Hotel
in Montréal, Quebec from
7:30 to 9:30 p.m.. The
meeting will coincide with
the International Joint
Commission's Public Forum
on Great Lakes-St. Lawrence
(continued on next page)

Lake Ontario Outflow Activity

The recent heat-wave over northeastern United States and southern Ontario led to a huge demand for electricity. To increase the hydropower generation at the Moses-Saunders power plants in the St. Lawrence River, the International St. Lawrence River Board of Control authorized increases in Lake Ontario outflows on six occasions (July 24th and 25th and August 1st, 2nd, 7th and 8th). During parts of July and early August, the Board also authorized outflows more than specified by the regulation plan to prevent excessively low water levels on Lake St. Louis and in the Montréal region of the St. Lawrence River. These flow increases drew from the water the Board had previously conserved on Lake Ontario. In early August, there remained about 5.3 cm of conserved water on Lake Ontario.

In light of the continuing dry situation in the Montreal region of the St. Lawrence River, the Lake Ontario outflow for the rest of the summer is expected to be slightly more than specified by the regulation plan.



Water Quality, being held on September 14th and 15th at the same location. The Study invites you to take part in both events. For more information about the IJC's Public Forum, please visit www.ijc.org and click on "Montréal Public Forum".

The Study's public meeting agenda is being finalized as this newsletter goes to press. To obtain your copy of the agenda, visit the Study's web site at www.losl.org and click on "Upcoming Events" or contact Amanda Morelli by phone at (613) 992-5727.

The International Niagara
Board of Control will hold an
open house during the evening
of September 19, 2001 at the
Holiday Inn Fort Erie Convention Centre, 1485
Garrison Rd., Fort Erie,
Ontario. The open house is

FOR MORE INFORMATION:

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Editor, Chuck Southam

Aussi disponible en français

July Precipitation Over the Great Lakes As a percentage of the long-term July average:

Great Lakes Basin 51% L Lake Superior 68% (Lakes Michigan-Huron 45% L

Lake Erie 43% (including Lake St. Clair)
Lake Ontario 42%

NOTE: These figures are preliminary

scheduled to begin at 7:30 p.m.

The International Niagara Board of Control is a binational organization reporting to and advising the LIC on matters regarding water levels, flows and similar subjects pertaining to the Niagara River. The purpose of this open house is to inform the public of the Board's current activities and to hear public comments and suggestions regarding the Board's work. In addition, information will be presented on Great Lakes water levels. If you require additional information, please contact Len Falkiner at: (905) 336-4947.

Flow Measurements at Sault St. Marie

From July 25th until July 31st the International Lake
Superior Board of Control carried out flow measurements at the
Compensating Works in the
St. Marys River. The

measurements took place with gate open settings from their usual setting equivalent to 1/2 gate open to as much as four gates fully open. The purpose flow measurements is to develop a more accurate method of continuously recording the flows through the structure for different gate open settings. The Lake Superior outflows for the rest of the summer are expected to be as specified by the regulation plan.

July Outflows From the Great Lakes

As a percentage of the long-term July average:

Lake Superior 97%
Lake Huron 83%

Lake Erie 87% Lake Ontario 85%



LEVEL news Great Lakes - St. Lawrence River



Volume 9, Number 9

September 8, 2001

Levels Decline on All Lakes Except Superior

Levels on All Lakes Except Superior Lower Than One Year Ago

Lake Superior's water level rose by less than it usually does during August. The level of Lakes Michigan-Huron declined by less than usual in August, while lakes St. Clair, Erie and Ontario all declined by about their average amounts during the month.

The water level of Lake Superior is currently about 8 cm higher than it was one year ago. The level of Lakes Michigan-Huron is about 8 cm lower than it was at this time last year. The levels of lakes St. Clair, Erie and Ontario are about 21, 28 and 19 cm lower than they were a year ago, respectively.

Lake Superior began September about 19 cm below its long-term average levels for this time of the year. Lakes Michigan-Huron remain about 55 cm below average--just a few centimetres above chart datum. Lakes St. Clair and Erie started September about 33 and 31 cm below average, respectively. Lake Ontario was 6 cm below average at the beginning of September.

The monthly mean level at Montréal Harbour averaged 26 cm below chart datum in August, and was below chart datum every day of the month.

The level of Lake Superior is near its annual peak and is expected to remain about the same in September as it was in August. The levels of lakes Michigan-Huron, St. Clair, Erie and Ontario are expected to continue their decline in September. Please refer to the Monthly Water Levels Bulletin for the forecast of the probable range of water levels on each lake for the next six months.

Did You Know?

The Great Lakes form a chain of lakes with each one draining into the next. Lake Superior, the largest of the five Great Lakes, drains into Lake Huron by way of the St. Marys River. Lake Michigan also drains into Lake Huron through the Straits of Mackinac. The straits are so wide and deep that the water levels in lakes (continued on next page)

Low Water Advisory

Users of the Great Lakes, connecting channels and St. Lawrence River should keep informed of current conditions before undertaking any activities that could be affected by low water levels. Mariners should have up-to-date navigation charts and know how water levels compare to chart datum. Mariners should exercise extreme caution throughout the entire system, especially during periods of strong winds when water levels can rise (set-up) or fall (set-down) significantly in a short period of time. If near-shore water levels fall due to strong winds, facilities such as marinas, docks and boat ramps may be temporarily inaccessible. Similarly, municipal and commercial/industrial users that draw their water supply from the system should be aware that if their water supply intakes have not been installed deep enough, they may be at risk of exposure if a large set-down is experienced.



SEP 25 2001 Canada

Michigan and Huron are the same. (This is the reason we often refer to lakes Michigan and Huron as Lakes Michigan-Huron.) From Lake Huron, water flows into Lake Erie via the St. Clair River, Lake St. Clair and the Detroit River. The water then flows into Lake Ontario through the Niagara River and the Welland Canal. Lake Ontario, in turn, empties into the St. Lawrence River. From there, the water flows into the Gulf of St. Lawrence and the Atlantic Ocean. In total, water travels some 3600 km from the western end of Lake Superior to the Gulf of St. Lawrence.

There is more to the Great .
Lakes than just the lakes.
The basin upstream of the power dam at Cornwall,
Ontario/Masssena, New York

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Editor, Chuck Southam

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August Precipitation Over the Great Lakes As a percentage of the long-term August average:

Great Lakes Basin 111%
Lake Superior 104%
Lakes Michigan-Huron 122%

Lake Erie 93% (including Lake St. Clair) Lake Ontario 109%

NOTE: These figures are preliminary

covers about 774 000 km² and contains a complex system of lakes, rivers and streams that flow into the Great Lakes. The five Great Lakes contain about 23 000 km³ of water covering a total area of about 244 000 km².

The Great Lakes constitute one of the largest freshwater systems on earth, containing about 18% of the world's surface freshwater. Only the polar ice caps and Lake Baikal in Siberia contain more freshwater than the Great Lakes. The Great Lakes provide water for consumption, transportation, power and recreation and play a major role in the ecology, climate, culture and economy of North America.

You can learn more about these vast inland freshwater seas, by exploring Environment Canada's *Our Great Lakes* web site. *Our Great Lakes* is an information resource that provides an index of

Environment Canada's Great Lakes programs, publications and databases, and is a window to other environmental networks.

You can find the

Our Great Lakes site at:

www.on.ec.gc.ca/glimr/

August Outflows From the Great Lakes

As a percentage of the long-term August average:

Lake Superior 93% Lake Huron 85% Lake Erie 87%
Lake Ontario 90%

OCT 3 1 2001

news



Volume 9, Number 10

Great Lakes - St.

October 9, 2001

Water Levels Decline on All Lakes Despite Rainfall **IJC Names Study Team**

Periods of moderate to heavy rainfall were experienced over many areas of the Great Lakes basin during the month of September. Although daily levels on Lakes Superior, Michigan-Huron and St. Clair responded to the rainfall, monthly mean water levels on all of the Great Lakes declined from August to September. Water levels are expected to continue to decline throughout the fall and winter.

The level of Lake Superior declined by a near-average amount from August to September, falling about 2 cm. Lake Superior began October about 24 cm below its long-term average, but 9 cm above its level at the same time last year.

The level of Lakes Michigan-

Huron declined by about half its average amount from August to September, falling about 2 cm. At the beginning of October, Lakes Michigan-Huron were 50 cm below their long-term average, 3 cm below levels recorded one year ago and just 1 cm above Chart Datum.

Lawrence River

Water levels on Lakes St. Clair and Erie declined by near-average amounts from August to September, falling 6 cm and 11 cm, respectively. Lake Ontario's level fell slightly more than average declining 19 cm. At the beginning of October, Lakes St. Clair, Erie and Ontario were 30, 30 and 12 cm below average. All three lakes began October several centimetres lower

than they were at the same time last year.

Montréal Harbour's monthly mean water level was 5.34 m in September. This was 1.01 m below the 1967-2000 average value for the month of September and it is a new record low for the month.

Three Public Meetings Planned

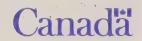
For the fall of 2001, members of the Public Interest Advisory Group, in conjunction with the International Lake Ontario -St. Lawrence River Study Board and other organizations, have organized the following three public (continued on next page)

Study Team Named

The International Joint Commission (IJC) has appointed a six-member Upper Great Lakes Plan of Study Team to prepare a plan for reviewing the regulation of the flow of water out of Lake Superior. The Plan of Study Team was appointed after the IJC received public comment on a draft directive for the effort at a series of meetings this past summer.

The Plan of Study Team will prepare a draft Plan of Study by October 18, 2001. Following public consultation on the draft, the team intends to provide a final Plan of Study to the IJC by January 11, 2002. The actual review of regulation is contingent upon funds being appropriated in the United States and Canada for the studies identified in the Plan of Study.





meetings in the Lake Ontario - St. Lawrence River area.

- October 11th, 2001 7:00 p.m. to 9:00 p.m. Apollo Middle School 750 Maiden Lane Rochester, NY USA
- October 18th, 2001 7:30 p.m. to 9:30 p.m. Delta Centre-Ville 777 University Street Montréal, QC Canada
- November 8th, 2001 7:00 p.m. to 9:00 p.m. Royal Botanical Gardens 680 Plains Road West Burlington, ON Canada

For more information, please contact Amanda Morelli, Public Information Officer. at (613) 992-5727.

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Editor, Chuck Southam Aussi disponible en français

September Precipitation Over the Great Lakes As a percentage of the long-term September average:

Lake Erie 116% Great Lakes Basin (including Lake St. Clair) 88% Lake Superior Lake Ontario 115% Lakes Michigan-Huron 129%

NOTE: These figures are preliminary

Last Edition for Seasonal Subscribers

For those of you who are on our mailing list for the Water Level Bulletin and LEVELnews for the six months from spring to fall only, this is the last edition you will receive this year. You will automatically start receiving both publications again in May 2002. If you would like to check water level conditions between now and then, please feel free to call us at one of the telephone numbers provided in the For More Information box, or contact the Canadian Hydrographic Service at the telephone number shown on the Bulletin. If you prefer, vou can access water level and related information through the OUR GREAT LAKES site at: www.on.ec.gc.ca/glimr/

No Longer Need Water Level Information Year-round?

125%

If you are on the year-round subscription mailing list, but have found that you only read the Water Level Bulletin and LEVELnews from spring to fall, please consider switching to a seasonal subscription. Moving to the seasonal mailing list will help us reduce costs and eliminate waste. If you would like to switch, just let us know.

September Outflows From the Great Lakes

As a percentage of the long-term September average:

Lake Superior 94% Lake Huron

87% Lake Erie Lake Ontario 91%



EVELnews



Great Lakes - St. Lawrence River

Volume 9, Number 11

November 9, 2001

Above-average Precipitation Slows Seasonal Decline on Middle Lakes **Fall Storm Season Begins**

Precipitation during the past several weeks has slowed the usual seasonal decline in water levels on Lakes Michigan-Huron, St. Clair and Erie. Rains along the St. Lawrence River valley and Ottawa River basin have also temporarily eased the low water level problems for navigation and other users in the Montréal region of the St. Lawrence River.

The level of Lake Superior declined by a near-average amount from September to October, falling about 7 cm. The lake began November 24 cm below its long-term average, about 11 cm above its level of one year ago.

The monthly mean level of Lakes Michigan-Huron increased by 2 cm from September to October instead

of declining as it usually does. At the beginning of October, Lakes Michigan-Huron were still 39 cm below their long-term average level, but about 13 cm higher than they were a year ago.

Water levels on both Lakes St. Clair and Erie declined by just 2 cm from August to September—about one-fifth their long-term average amounts. Lake Ontario's level fell slightly less than average, declining 11 cm. At the beginning of November, Lakes St. Clair, Erie and Ontario were 23, 20, and 7 cm below average, respectively.

Montréal Harbour's monthly mean water level was 5.53 m in October, 87 cm below the 1967-2000 period-of-record average value for the month,

and slightly below chart datum. Although October's monthly mean level was a new period-of-record low for the month, significantly increased flows from the Ottawa River helped raise the Harbour's October mean level 19 cm above that of September. Harbour levels are expected to average above chart datum during November.

Fall Storm Disrupts Shipping

The first major storm of the 2001 fall season over the Great Lakes, combined with low water levels, virtually halted commercial navigation on October 25-26. Sustained southwesterly winds of 40 to 50 knots depressed already low water levels on the (continued on next page)

Public Consultation on IJC Upper Great Lakes Plan of Study

The International Joint Commission's (IJC) Upper Great Lakes Plan of Study Team will be conducting public consultation sessions at eight locations throughout the upper Great Lakes basin, during the period October 31 through November 15, 2001. Meeting locations and times can be found on the IJC's web site (www.ijc.org). Although mailing-list subscribers to LEVELnews will receive this month's edition after the public consultation meetings have taken place, the Study Team welcomes and encourages input. Comments on the draft plan of study are welcome until November 30, 2001. For further information, including the draft plan of study, you can access the Study web site at: http://huron.lre.usace.army.mil/ijc/uglpos/







St. Clair and Detroit Rivers and the western end of Lake Erie, causing over 50 ships to drop anchor or remain tied up at docks. The water level at the western end of Lake Erie dropped 1.7 m below prestorm levels to more than one metre below chart datum, making it unsafe for loaded ships to sail and draining local marinas. Upbound traffic on the Welland Canal was also halted due to high winds.

Lake Ontario Outflow Strategy

During the summer of 2001, the International St. Lawrence River Board of Control (Board) used some of the water that it had stored on Lake Ontario last fall and winter, to assist several interests. On October 21,

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Editor, Chuck Southam

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October Precipitation Over the Great Lakes As a percentage of the long-term October average:

Great Lakes Basin 172% Lake Superior 145% Lakes Michigan-Huron 190% Lake Erie 219% (including Lake St. Clair) Lake Ontario 114%

NOTE: These figures are preliminary

1.3 cm of stored water remained on Lake Ontario.

The Board met on October 22 to considered existing and potential future water level and water supply conditions. In light of their assessment, the Board announced the following regulation strategy.

A maximum weekly overdischarge of 600 m³/s will be utilized as required for the following purposes:

- Ensure the water level at Montréal Harbour is at least chart datum when required by deep draft ship arrivals and departures.
- Maintain a level of at least 20.6 m on Lac St. Louis.
- Ensure outflow increases to meet hydropower generation requirements when necessary.

Over-discharge is the amount of Lake Ontario outflow more than that specified by the lake's regulation plan.

In addition to using the 1.3 cm stored water that remains on Lake Ontario, the outflow increases for the purposes mentioned above may use the equivalent of an additional 6 cm of water. The strategy also allows for outflows less than amounts specified by the regulation plan if downstream conditions are favourable to do so. The strategy will be reviewed should accumulated over-discharges reach 6 cm below Plan level, but in any event no later than early December. If the situation changes significantly in the interim, the Board will modify the strategy as necessary.

October Outflows From the Great Lakes As a percentage of the long-term October average:

Lake Superior 85% Lake Huron 89% Lake Erie 92% Lake Ontario 89%

FULLnews Great Lakes - St. Lawrence River

Water

Volume 9, Number 12

December 7, 2001

November Precipitation Continues Helps Slow Seasonal Decline **CHS Web Site Is Back On-Line**

Unseasonably mild weather was experienced throughout much of the Great Lakes region during November. The region's first major snowstorm of the season occurred during the last week of the month. The storm brought snow to the northern portion of the basin and was accompanied by rain and freezing rain over parts of eastern Ontario and western Ouebec.

As was the case during October, rainfall received during November helped slow the seasonal decline in the water levels of the Great Lakes. While all the lakes remain below average, the current water levels on Lakes Superior and Michigan-Huron are noticeably higher than levels recorded one year ago. The regional rainfall

and in particular high flows from the Ottawa River eased the low water level problems for navigation and other users in the Montréal region of the St. Lawrence River.

The monthly mean level of Lake Superior declined by just 1 cm from October to November. The lake began December 17 cm below its long-term average, but about 18 cm above its level of one year ago.

The monthly mean level of. Lakes Michigan-Huron increased by 2 cm from October to November instead of declining as it usually does. At the beginning of December, the level of Lakes Michigan-Huron was 35 cm below average, but 21 cm higher than one year ago. Notable is the fact that water

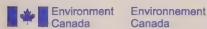
levels on Lakes Michigan-Huron were 55 cm below average as recently as the beginning of September.

Water levels on Lakes St. Clair, Erie and Ontario all declined by less than average from October to November falling just 3, 1, and 5 cm. respectively. At the beginning of December, Lakes St. Clair, Erie and Ontario were 10, 16, and 3 cm below average, respectively.

Montréal Harbour's monthly mean water level was 5.78 m in November, 74 cm below the 1967-2000 period-ofrecord average for the month. Except for two days, levels at Montréal in November were higher than the chart datum elevation of 5.55 m.

Water Level Advisory

Water levels on Lakes Superior, Michigan-Huron, St. Clair and Erie are well below their all-time averages for this time of year. Lakes Superior and Michigan-Huron are at levels slightly above the level of Chart Datum. Lake Ontario is slightly below its all-time average for this time of year. The water level at Montréal Harbour on the St. Lawrence River is well below its all-time average for this time of year but is above the level of Chart Datum. Mariners should exercise extreme caution throughout the entire system, especially during periods of strong winds when water levels can rise or fall significantly in a short period of time.







Lake Superior Outflow Regulation

Reflecting an increase in water supplies to the upper lakes during November, Regulation Plan 1977-A has specified a small increase in the Lake Superior outflow for December.

The IJC's Upper Great Lakes Plan of Study Team has completed its public meetings on the proposed study to improve Lake Superior outflow regulation. The meetings were well attended by citizens and representatives of interest groups. The team is currently incorporating public comments and inputs, and is expected to submit its draft plan of study to the IJC in January 2002.

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Editor, Chuck Southam

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November Precipitation Over the Great Lakes As a percentage of the long-term November average:

Great Lakes Basin 109% Lake Erie 119%
Lake Superior 124% (including Lake St. Clair)
Lakes Michigan-Huron 104% Lake Ontario 91%

NOTE: These figures are preliminary

Lake Ontario Outflow Regulation

With improved water level conditions in the Montréal region during November, Lake Ontario outflows greater than specified by the regulation plan were no longer necessary. Since early November, the daily outflows have been either at, or slightly less than those specified by the regulation plan. At the end of November all previous underdischarges have amounted to 2.6 cm of water being conserved on Lake Ontario.

As in recent years, Seaway navigation this year on the Great Lakes and the St. Lawrence River is expected to end sometime around Christmas. Water temperatures in the upper St. Lawrence River in late November were slightly higher than the average recorded over the past 10 years. If needed, short-term adjustments in the Lake Ontario outflow will be made

to help facilitate the proper formation of ice cover in the St. Lawrence River.

CHS Web Site Back On-line

The Canadian Hydrographic Service Tides and Water Levels Web Site is now back on-line at address chswww.bur.dfo.ca/danp/. The web site can also be accessed through the OUR GREAT LAKES page at www.on.ec.gc.ca/glimr/.

November Outflows From the Great Lakes As a percentage of the long-term November average:

Lake Superior 77%
Lake Huron 91%

Lake Erie 89% Lake Ontario 87%



LEVEL news Great Lakes - St. Lawrence River

News Lawrence River Water Levels

Volume 10, Number 1

January 8, 2002

Cold Weather Leads to Significant Lake-effect Snow Subscribe to Ripple Effects Newsletter

A dramatic shift to colder temperatures late in December caused increased evaporation from the Great Lakes and led to significant lake-effect snowfalls in traditional snowbelt areas throughout the region.

Although monthly mean water levels on all lakes, except Lakes Michigan-Huron, increased from November to December, daily levels on each lake started to decline during the final week of December as a result of the evaporation of water from lakes. Water levels on all of the Great Lakes, except Lake Ontario, are expected to continue to decline during the month of January.

Compared to their long-term levels for the beginning of January, Lake Superior was 11 cm below average. Lakes Michigan-Huron were 34 cm below average, Lake St. Clair was 20 cm below average and Lake Erie was 12 cm below average. Lake Ontario, on the other hand, was at its long-term average level. Montréal Harbour's monthly mean water level was 5.94 m in December, 66 cm below the 1967-2000 period-ofrecord average for the month.

The last ship of the 2001 Seaway season exited the section of the Seaway between Lake Ontario and Montréal on December 24th. The New York Power Authority crew completed installation of the Lake Erie - Niagara River Ice Boom on December 22nd.

IJC Public Hearings

The International Joint Commission (IJC) will hold public hearings in Sault Ste. Marie, Michigan and Sault Ste. Marie, Ontario to gather information about the impacts of peaking and ponding operations in the St. Marys River.

Peaking and ponding operations are carried out by the Edison Sault Electric Company and Great Lakes Power Limited to store water during times of off-peak demand and increase hydroelectric power generation during times of peak demand.

(continued on next page)

Concerned about Water Levels on Lake Ontario and the St. Lawrence River?

Here's an opportunity for you to voice your concerns regarding water levels on Lake Ontario and the St. Lawrence River. The International Joint Commission (IJC) has established the International Lake Ontario-St. Lawrence River Study Board to assess and evaluate the Orders of Approval and current criteria used for regulating water levels on Lake Ontario and the St. Lawrence River. Subscribe to the Study Board's newsletter, *Ripple Effects*, to learn more about the Study and how you can participate in its activities. To receive the Winter 2002 edition of *Ripple Effects*, please complete and return the postcard included in this month's mailing, or visit the Study website at: www.losl.org and subscribe online. To receive the Winter 2002 edition of *Ripple Effects*, be sure to subscribe by February 15, 2002.







The IJC has asked the International Lake Superior Board of Control (Board) to review the current situation and recommend whether peaking and ponding operations in the St. Marys River should continue, and if so, under what circumstances. The public hearings are intended to provide information that may be useful to the Board in preparing its report. The public hearings will take place at the following times and locations:

January 28th at 3:00 p.m.

Walker Cisler Center
Lake Ontario Room
Lake Superior University
Sault Ste. Marie, Michigan

January 28th at 7:00 p.m.

Holiday Inn Waterfront Room: Thompson A & B 208 St. Mary's River Drive Sault Ste. Marie, Ontario

FOR MORE INFORMATION:

Ralph Moulton, Manager Great Lakes-St. Lawrence Water Level Information Office P.O. Box 5050 Burlington, ON L7R 4A6 Tel. (905) 336-4580 FAX: (905) 336-8901 E-mail: water.levels@ec.gc.ca http://www.on.ec.gc.ca/glimr/

Peter Yee Great Lakes-St. Lawrence Regulation Office 111 Water Street East Cornwall, ON K6H 6S2 Tel. (613) 938-5725 E-mail: peter_yee@pch.gc.ca

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Editor, Chuck Southam

Aussi disponible en français

December Precipitation Over the Great Lakes As a percentage of the long-term December average:

Great Lakes Basin 92%
Lake Superior 73%
Lakes Michigan-Huron 94%

Lake Erie 108% (including Lake St. Clair) Lake Ontario 99%

NOTE: These figures are preliminary

Lake Ontario Outflow Strategy

The International
St. Lawrence River Board of
Control (Board) met on
December 14th to consider
existing and potential future
water level and supply
conditions. In light of their
assessment, the Board
announced the following
outflow strategy for
following three months:

Generally, outflows specified by Plan 1958-D will be followed. The Board will use opportunities, if any, for under-discharge to conserve up to an additional 5 cm of water on Lake Ontario. Such opportunities might arise if outflows are reduced to below Plan 1958-D specified amounts to assist in ice formation, or due to limited hydropower generation capacity. Critical needs of hydropower and navigation will be met. The Board intends to review this strategy in mid-February, or before if conditions require.

1998 Ice Storm Remembered

The severe ice storm that struck eastern Canada in early January 1998 caused difficulties for operation of the St. Lawrence River flow control structures. At the peak of the ice storm there were widespread power outages due to downed power lines and towers. This led the International St. Lawrence River Board of Control to direct large temporary reductions in flows at hydroelectric power plants in the St. Lawrence River. These difficulties were compounded by limitations on flow necessary to help the formation of a strong and smooth ice cover on the St Lawrence River. The reduced outflows combined with very heavy precipitation led to a 44 cm increase in Lake Ontario's water level from the beginning to the end of January 1998.

December Outflows From the Great Lakes As a percentage of the long-term December average:

Lake Superior 95% Lake Huron 93% Lake Erie 96% Lake Ontario 90%

Government Publications

Great Lakes - St. Lawrence River

Water Levels

Volume 10, Number 2

February 8, 2002

Daily Water Levels on Lakes St. Clair, Erie and Ontario Respond to Precipitation The Rt. Hon. Herb Gray Appointed to the IJC

After experiencing unseasonably warm weather during the latter part of January, the lower Great Lakes region experienced a dramatic shift back to winter weather at the end of the month as a major storm system pasted through the region and along the upper St. Lawrence River.

Along with high winds, the storm brought precipitation in the form of rain, freezing rain and snow. While monthly mean water levels on all of the Great Lakes, except Lake Ontario, declined from December to January, daily water levels on Lakes St. Clair, Erie and Ontario increased at the end of January in response to the precipitation.

Daily water levels on Lakes Superior and Michigan-Huron fell below their respective chart datum levels during January. The levels of Lakes St. Clair and Ontario moved above average. While water levels on the other lakes remain below average, the levels on all lakes are higher than they were at the same time last year.

Compared to their long-term levels for the beginning of February, Lake Superior was 15 cm below average, Lakes Michigan-Huron were 38 cm below average and Lake Erie was 4 cm below average. Lakes St. Clair and Ontario, on the other hand, were 2 cm above their long-term average levels. At the beginning of February, water levels on Lakes Superior, Michigan-

Huron, St. Clair and Erie were around 20 cm higher than they were one year ago. Lake Ontario began February about 10 cm higher than it was at the same time last year.

Montréal Harbour's monthly mean water level was 5.81 m in January, 105 cm below its period-of-record average level for the month.

Monthly mean water levels are expected to decline on Lakes Superior and Michigan-Huron from January to February. Water levels are expected to increase on Lakes St. Clair, Erie and Ontario. Please refer to the current Monthly Water Levels Bulletin for the most recent six-month water level forecast on each lake. (continued on next page)

The Rt. Hon. Herb Gray Appointed to the Canadian Section of the IJC

On Wednesday, January 16th the Rt. Hon. Herb Gray took his oath as a Commissioner and Chairman of the Canadian Section of the International Joint Commission (IJC) in a short ceremony and official meeting of Commissioners that linked by telephone U.S. Chairman Tom Baldini, Commissioners Robert Gourd and Jack Blaney as well as Canadian Secretary Murray Clamen, U.S. Secretary Gerry Galloway and Regional Office Director Gail Krantzberg.

The IJC is an international organization established by the Boundary Waters Treaty of 1909 to prevent and resolve disputes over the use of waters shared by the United States and Canada.



Environnement Canada





Year 2001 in Review

Water levels on all of the Great Lakes, except Lake Ontario, were several centimetres below average during 2001 as a result of low water supplies to the lakes that began in 1997 on the upper lakes. Although water supplies to Lake Ontario were below average during the year, below-average outflows had an offsetting effect and helped keep the lake's level closer to average.

Mild, wet weather during the fall of 2001 slowed, and in some cases temporarily reversed, the usual seasonal decline in water levels on each of the Great Lakes. As a result, water level conditions on each lake improved relative to their long-term seasonal averages and all lakes ended 2001 with levels higher than those recorded at the beginning of the year.

FOR MORE INFORMATION:

Ralph Moulton, Manager Great Lakes-St. Lawrence Water Level Information Office P.O. Box 5050 Burlington, ON L7R 4A6 Tel. (905) 336-4580 FAX: (905) 336-8901 E-mail: water.levels@ec.gc.ca http://www.on.ec.gc.ca/glimr/

Peter Yee Great Lakes-St. Lawrence Regulation Office 111 Water Street East Cornwall, ON K6H 6S2 Tel. (613) 938-5725 E-mail: peter_yee@pch.gc.ca

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Editor, Chuck Southam

Aussi disponible en français

January Precipitation Over the Great Lakes As a percentage of the long-term January average:

Great Lakes Basin 67% Lake Erie 116%
Lake Superior 50% (including Lake St. Clair)
Lakes Michigan-Huron 56% Lake Ontario 82%

NOTE: These figures are preliminary

Due to low flows from the Ottawa River and other tributaries to the Montréal region of the St. Lawrence River, levels at the Port of Montréal set new record lows for several months in 2001.

The low water levels resulted in below-average hydropower generation in the St. Marys, Niagara and St. Lawrence rivers. They also required some ships to reduce their cargo or suspend operations when strong winds depressed already low water levels. Other problems included unusable docks and ramps, and reduced water depths for recreational boaters. Shallow shore-wells were impacted and there were additional operating costs related to water withdrawal for some domestic and industrial users.

The regulation plan for Lake Superior performed as designed to help balance water level conditions upstream on Lake Superior and downstream on Lakes Michigan-Huron.

To provide relief to users in the Montréal region affected by low water levels, the International St. Lawrence River Board of Control released some of the water it had previously conserved on Lake Ontario. Assistance was also given to hydropower interests by releasing some of the stored water during the late-July, early-August heat wave when the demand for electricity was very high.

January Outflows From the Great Lakes As a percentage of the long-term January average:

Lake Superior 104% Lake Erie 100%
Lake Huron 104% Lake Ontario 97%

LEVEL news Great Lakes - St. Lawrence River

Water Levels

Volume 10, Number 3

March 8, 2002

Great Lakes Remain Virtually Ice-Free Five-city Teleconference Planned

Except for some ice cover in protected bays and shallow inlets, the Great Lakes remained ice-free at the beginning of March. The open-water conditions being experienced have allowed the evaporation of water from the lakes to continue and produced some lake-effect snowstorms in traditional snowbelt areas. This year's ice season on International Section of the St. Lawrence River is the shortest one experienced since record keeping began in 1960. If ice-free conditions continue on Lake Erie, removal of the Lake Erie - Niagara River Ice Boom is expected to take place sometime during March.

The monthly mean water levels of Lakes Superior and Michigan-Huron declined more than usual from January to February falling 9 and 4 cm, respectively. These lakes remain below average and below their respective chart datum levels, but 15 to 20 cm higher than they were at the same time last year. At

the beginning of March, Lake Superior was 15 cm below average. Lakes Michigan-Huron began the month 37 cm below average.

Responding to rainfall and associated runoff, monthly mean water levels on Lakes St. Clair and Erie increased instead of declining from January to February and Lake Ontario levels increased more than they usually do. Monthly mean water levels on Lake St. Clair, Erie and Ontario rose 8, 12 and 12 cm, respectively, from January to February. Lake St. Clair began March about 6 cm below average. Lake Erie began the month just 1 cm below average, whereas Lake Ontario was 13 cm above average. At the beginning of March, Lakes St. Clair, Erie

and Ontario were 3, 10 and 14 cm higher than they were one year ago, respectively.

Montréal Harbour's monthly mean water level was 6.05 m in February, 101 cm below its period-of-record average level for the month, but 50 cm above its chart datum level.

The water level of Lake
Superior is expected to
remain stable or decline
slightly during March. Water
levels on the rest of the Great
Lakes are expected to
increase slightly. Please refer
to the current Monthly Water
Levels Bulletin for the most
recent six-month water level
forecast on each lake.

You're invited to attend a multi-city teleconference

The International St. Lawrence River Board of Control invites you to participate in a multi-city teleconference on the evening of March 21, 2002. The purpose is to increase public input about local conditions and impacts of concern related to water levels and flows in Lake Ontario and the St. Lawrence River. You may participate in the teleconference from one of five local meeting sites. (Item continued on next page: Meeting Sites)







Meeting Sites (continued from page 1)

Montréal, Quebec

Centre Communautaire Sarto-Desnoyers, 1335 avenue Bord-du-lac, Dorval, Quebec

Cornwall, Ontario

Best Western Parkway Inn, 1515 Vincent Massey Drive

Toronto, Ontario

Black Creek Pioneer Village, 1000 Murray Ross Parkway (South side of Steeles Ave.)

Alexandria Bay, New York Riveredge Resort Hotel, 17 Holland Street

Rochester, New York

Rochester Institute of Technology, College of Engineering, Gleason Building (09), Xerox Auditorium, Room 09-2580, Jefferson Road at East River Road, Henrietta, NY

FOR MORE INFORMATION:

Ralph Moulton, Manager
Great Lakes-St. Lawrence Water
Level Information Office
P.O. Box 5050
Burlington, ON L7R 4A6
Tel. (905) 336-4580
FAX: (905) 336-8901
E-mail: water.levels@ec.gc.ca
http://www.on.ec.gc.ca/glimr/

Peter Yee Great Lakes-St. Lawrence Regulation Office 111 Water Street East Cornwall, ON K6H 6S2 Tel. (613) 938-5725 E-mail: peter_yee@pch.gc.ca

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Editor, Chuck Southam

Aussi disponible en français

February Precipitation Over the Great Lakes As a percentage of the long-term February average:

Great Lakes Basin 128% Lake Superior 133% Lakes Michigan-Huron 140% Lake Erie 137% (including Lake St. Clair) Lake Ontario 75%

NOTE: These figures are preliminary

Meeting Format

6:30 p.m. - 7:30 p.m.
A Board member or representative will facilitate each local meeting and provide information on current conditions and the water levels outlook. Public participants will determine the information to be conveyed on the conference call.

7:30 p.m. - 8:30 p.m.
The teleconference will link the five local meetings. The teleconference chair will request one specific comment from each site, rotating among and returning to sites in order to elicit as much information as possible about local conditions and impacts of concern.

8:30 p.m. - 9:00 p.m. Participants will be asked to evaluate the teleconference. Board members or staff will remain available for wrap-up.

RSVP

In order to facilitate logistical arrangements, please RSVP to one of the secretaries below. Please indicate which local meeting you plan to attend. Those who have RSVP'd will be notified in advance if the location changes. Updates will also be posted at www.islrbc.org.

Reg Golding, Secretary, Canadian Section 200 Kent Street Ottawa, Ontario K1A 0E6 Tel.: (613) 990-5617 GoldingR@dfo-mpo.gc.ca

John Kangas, Secretary, United States Section 1111 North Canal Street Chicago, Illinois 60606-7205 Tel.: (312) 353-4333 john.w.kangas@usace.army.mil

February Outflows From the Great Lakes As a percentage of the long-term February average:

Lake Superior 98%
Lake Huron 101%

Lake Erie 106% Lake Ontario 92%

CAL MT160 Glot

LEVEL news Great Lakes - St. Lawrence River Water



Volume 10, Number 4

April 8, 2002

Water Levels Increase on all Lakes Except Lake Superior IJC Extends Authority for Peaking and Ponding Operations

Monthly mean water levels increased on all lakes except Lake Superior from February to March. Lakes Michigan-Huron has joined lakes St. Clair, Erie and Ontario in their annual seasonal rises. Lake Superior is expected to begin its seasonal rise during April.

Monthly levels on Lake
Superior declined by 3 cm
from February to March.
Lake Superior began April
about 16 cm below its longterm average level. While
the lake remains almost
10 cm below the lake's Chart
Datum level, it is about
20 cm higher than it was at
the same time last year.
Water levels on Lake

Superior are expected to increase slightly during April.

The level of Lakes Michigan-Huron rose about 4 cm from February to March. The lakes remain about 37 cm below average, but levels are 22 cm higher than they were last year at the same time and are expected to climb above Chart Datum during April.

Lakes St. Clair and Erie levels rose slightly less than expected from February to March, increasing 3 and 5 cm, respectively. At the beginning of April, lakes St. Clair and Erie were 15 cm and 4 below average. Both lakes, however, are about 13 cm higher than they were one year ago.

Lake Ontario's level rose slightly more than expected from February to March, increasing by 11 cm. The lake began April about 8 cm above average and about 12 cm higher than it was at the same time last year.

A fragile ice cover coupled with the breakage of the ice boom just upstream of the Beauharnois powerhouse necessitated that Lake Ontario outflows be less than the amount specified by the regulation plan during February. These underdischarges combined with the water previously retained, resulted in 9.6 cm of water being retained on Lake (continued on next page)

St. Marys River Peaking and Ponding Operations

The International Joint Commission (IJC) has extended the authority for the Edison Sault Electric Company and Great Lakes Power Ltd. to conduct peaking and ponding operations in the St. Marys River, under the supervision of its International Lake Superior Board of Control until March 20, 2003.

In giving the one-year extension, the IJC has asked the Board to undertake further technical investigations and gather operational experience, and to report its findings by the end of 2002. Each month, the hydropower entities at Sault Ste. Marie receive an allocation of water of the St. Marys River flow for hydropower purposes. Peaking and ponding operations involve varying the flows at the hydropower plants to meet energy demand, which fluctuates during the day and the week.

For further information on St. Marys River peaking and ponding operations, please visit the IJC's website at http://www.ijc.org.



MAY 1 2002



Ontario. Outflows greater than those specified by the regulation plan during March brought the amount retained on the lake back to 7.9 cm, which is the amount agreed to by the International St. Lawrence River Board of Control for the purpose of assisting downstream users later this year.

Daily outflows from Lake Ontario are expected to be as specified by the regulation plan during April. If needed, reductions in outflow will be made to prevent Lake St. Louis level from rising above its flood alert stage during the Ottawa River freshet.

Montréal Harbour's monthly mean water level was 6.26 m during March, 79 cm below its period-of-record average level for the month, but 71 cm above its Chart Datum level.

FOR MORE INFORMATION:

Ralph Moulton, Manager Great Lakes-St. Lawrence Water Level Information Office P.O. Box 5050 Burlington, ON L7R 4A6 Tel. (905) 336-4580 FAX: (905) 336-8901 E-mail: water.levels@ec.gc.ca

Peter Yee Great Lakes-St. Lawrence Regulation Office 111 Water Street East Cornwall, ON K6H 6S2 Tel. (613) 938-5725 E-mail: peter_yee@pch.gc.ca

http://www.on.ec.gc.ca/glimr/

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Editor, Chuck Southam

Aussi disponible en français

March Precipitation Over the Great Lakes As a percentage of the long-term March average:

Great Lakes Basin 131% Lake Superior 166% Lakes Michigan-Huron 128% Lake Erie 114% (including Lake St. Clair) Lake Ontario 107%

NOTE: These figures are preliminary

St. Lawrence Board Holds Multi-City Teleconference

The International St. Lawrence River Board of Control held a highly successful multi-city teleconference on March 21. The teleconference connected Alexandria Bay and Rochester, New York, Cornwall and Toronto, Ontario and Montréal, Ouebec. The teleconference provided an opportunity for participants at each site to discuss issues related to water levels and flows in the Lake Ontario – St. Lawrence River system with Board representatives as well as hear the views and concerns of participants at the other sites.

Remember that the St.

Lawrence Board and other

IJC Board web sites can be accessed at:

http://www.ijc.org.

Lake Erie – Niagara River Ice Boom

Except for thin ice at times in some protected bays and shallow inlets, Lake Erie remained virtually ice-free for the winter of 2001-2002. As a result, removal of the Lake Erie - Niagara River Ice Boom was completed on March 7. The earliest ice boom opening was on March 5, 1998 and the latest was May 3, 1971.

Seaway Opens

The opening of the 2002 Seaway navigation season in the St. Lawrence River and Welland Canal took place on March 26.

March Outflows From the Great Lakes

As a percentage of the long-term March average:

Lake Superior 96% Lake Huron 94% Lake Erie 102% Lake Ontario 102%

LEVELnews



Volume 10, Number 6

June 7, 2002

Seasonal Rise Continues on All Lakes ...But Lakes St. Clair, Erie and Ontario are Nearing Their Annual Peaks

Monthly mean water levels on all of the Great Lakes and Lake St. Clair increased from April to May. Water levels on all lakes are expected to rise during June; however. lakes St. Clair, Erie and Ontario are likely nearing their annual peaks.

Monthly mean water levels on lakes Superior, Michigan-Huron, St. Clair and Erie rose by about their usual amounts from April to May, increasing by 9 to 13 cm. Lake Ontario's level increased more than usual during the same period of time, increasing 24 cm. Lakes Superior, Michigan-Huron and St. Clair began June

about 15, 30 and 9 cm below average, respectively. Lakes Erie and Ontario began the month 2 and 27 cm above average, respectively. Lake Superior began June at about the same level as it was last year. Lakes Michigan-Huron. St. Clair and Erie began the month 19 to 24 cm higher than they were one year ago. while Lake Ontario was 34 cm higher.

Montréal Harbour's monthly mean water level was 7.17 m during May, 11 cm below its period-of-record average level for the month, but well above its Chart Datum level and 117 cm higher than it was during May 2001.

Lake Ontario **Outflow Strategy**

Between May 18th and 31st, Lake Ontario's outflow was set 150 m³/s greater than called for by the lake's regulation plan, Plan 1958-D. On June 1st, the overdischarge was increased to 300 m³/s. The over-discharge is expected to end later in June once Lake Ontario's level has peaked. These over-discharges will reduce some of the 7.9 cm of water previously retained on Lake Ontario, but leave a few centimetres on the lake to help meet hydropower generation and downstream navigation needs later this year.

The International St. Lawrence River Board of Control (the Board) is closely monitoring water supply and level conditions in the Lake Ontario-St. Lawrence system and will update its regulation strategy if conditions warrant it. Up-to-date information can be found on the Board's website at: www.islrbc.org/

Be Up-to-date

Recreational boaters on the Great Lakes, connecting channels and St. Lawrence River should keep informed of current conditions before setting out. Be sure you have up-to-date navigation charts and know how water levels compare to Chart Datum whenever and wherever you cruise or sail. Present water levels on the Great Lakes and upper St. Lawrence River are available by telephone from a network of gauging stations operated by the Canadian Hydrographic Service. Additional information about this service is provided on the back page. Watch next month's edition of LEVELnews for information on accessing water level data at selected gauges on the lower St. Lawrence River and on the U.S. side of the Great Lakes.







Accessing Water Level Data by Telephone

Present water levels on the Great Lakes and St. Lawrence River are available from a network of gauging stations operated by the Canadian Hydrographic Service. Phone numbers for the stations are listed below. When you call a particular station, the answering equipment will ask you to press 1 for English or 2 for French, on the keypad of your touch-tone phone. If you do not have a touch-tone phone, the message will start after a few seconds delay. The present water level is given in metres relative to chart datum at that station. Next the message gives the high and low water levels recorded during the previous 12 hours, followed by the elevation of chart datum. You can press 1 or 2 at any time during the message to have it start again, or press 0 to end the call.

FOR MORE INFORMATION:

Ralph Moulton, Manager Great Lakes-St. Lawrence Water Level Information Office P.O. Box 5050 Burlington, ON L7R 4A6 Tel. (905) 336-4580 FAX: (905) 336-8901 E-mail: water.levels@ec.gc.ca

E-mail: water.levels@ec.gc.ca http://www.on.ec.gc.ca/glimr/

Peter Yee
Great Lakes-St. Lawrence
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111 Water Street East
Cornwall, ON K6H 6S2
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Editor, Chuck Southam

Aussi disponible en français

May Precipitation over the Great Lakes As a percentage of the long-term May average:

Great Lakes Basin 127% Lake Erie 140%
Lake Superior 112% (including Lake St. Clair)
Lakes Michigan-Huron 123% Lake Ontario 152%

NOTE: These figures are preliminary

Lake Superior	at Thunder Bay	(807) 344-3141
Dake Superior	at Rossport	(807) 824-2250
	at Michipicoten	(705) 856-0077
	at Gros Cap	(705) 779-2052
C4 Manua Divar	above the lock	(705) 949-2066
St. Marys River	below the lock	(705) 254-7989
North Channel	at Thessalon	(705) 842-2215
North Chamier	at Little Current	(705) 368-3695
Georgian Bay	at Parry Sound	(705) 746-6544
Georgian Day	at Collingwood	(705) 445-8737
Lake Huron	at Tobermory	(519) 596-2085
Lano Hanon	at Goderich	(519) 524-8058
St. Clair River	at Point Edward	(519) 344-0263
Dt. 0	at Port Lambton	(519) 677-4092
Lake St. Clair	at Belle River	(519) 728-2882
Detroit River	at Amherstburg	(519) 736-4357
Lake Erie	at Bar Point	(519) 736-7488
	at Kingsville	(519) 733-4417
	at Erieau	(519) 676-1915
	at Port Stanley	(519) 782-3866
	at Port Dover	(519) 583-2259
	at Port Colborne	(905) 835-2501
Lake Ontario	at Port Weller	(905) 646-9568
	at Burlington	(905) 544-5610
	at Toronto	(416) 868-6026
	at Cobourg	(905) 372-6214
•	at Kingston	(613) 544-9264
St. Lawrence River		(613) 345-0095
	at Iroquois above lock	(613) 652-4426
	at Iroquois below lock	(613) 652-4839
	at Morrisburg	(613) 543-3361
	at Cornwall	(613) 930-9373
	at Summerstown	(613) 931-2089

Please call (905) 336-4844, fax: (905) 336-8916, or e-mail: solvasonr@dfo-mpo.gc.ca to report any problems or to obtain additional information.

May Outflows from the Great Lakes

As a percentage of the long-term May average:

Lake Superior 95% Lake Erie 101% Lake Huron 88% Lake Ontario 102%

LEVEL news

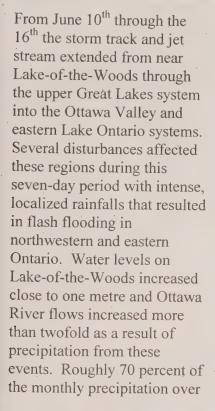
News Lawrence River Water Levels

Volume 10, Number 7

Great Lakes - St.

July 8, 2002

June Highlighted by Intense, Localized Rainfall Events PDF Version of LEVELnews Now Available



the Lake Ontario basin fell during this period of time.

The daily outflows from Lake Ontario during June averaged about nine percent higher than the long-term June average. Since May 18th, the outflow has been more than the amount specified by the regulation plan except for the period June 15th to 21st, when the outflow was as specified by the regulation plan to help prevent flooding on Lake St. Louis due to high Ottawa River flows. The overdischarge will continue until all the water reserved on Lake Ontario due to previous deviations from the regulation plan is released

from Lake Ontario. At the beginning of July the amount of this reserve was about 4 cm.

Lakes Superior and Michigan-Huron began July 16 and 27 cm below average, respectively. Lakes St. Clair and Erie began the month 6 and 3 cm below average, whereas Lake Ontario level was about 27 cm above average. Present levels on each of the Great Lakes. except Lake Superior, are 20 to 30 cm higher than those of one year ago. Lake Superior is at about the same level as it was last year. Based on daily water level trends observed (continued on next page)

PDF Version of LEVEL*news* Now Available on the Internet

For several years now, an electronic version of LEVEL*news* has been posted on the Internet around the 9th or 10th of each month. Starting this month, an Adobe Portable Document Format (or PDF) version of LEVEL*news* will also be available. When viewed or printed, the PDF version will have virtually the same look and feel as the one distributed by mail.

To view the PDF version, please click on the PDF-version link to the current issue on the LEVEL*news* web page at: http://www.on.ec.gc.ca/water/level-news/intro-e.html .

In order to view and print the file you will need to have Adobe Acrobat Reader installed on your computer. If you don't have Acrobat Reader on your computer, it can be downloaded free of charge from Adobe. A link to download the reader is provided on the LEVEL*news* web page.

Once you've view and printed LEVEL*news*, be sure to go to the latest Monthly Water Level Bulletin located at: http://chswww.bur.dfo.ca/danp/wlgraphs e.html.

during June, it is likely that lakes St. Clair, Erie and Ontario have attained their peak levels for this year. Further increases in the levels of lakes Superior and Michigan-Huron are expected during July.

Montréal Harbour's monthly mean water level was 6.99 m during June, 25 cm higher than its 1967-2001 period-of-record average level for the month and 143 cm higher than it was during June 2001.

More St. Lawrence River Water Level Information

Since this spring, the Canadian Hydrographic Service-Quebec Region, with the collaboration of Environment Canada, has added two new stations to the existing water level information network: Pointe-

FOR MORE INFORMATION:

Ralph Moulton, Manager Great Lakes-St. Lawrence Water Level Information Office P.O. Box 5050 Burlington, ON L7R 4A6 Tel. (905) 336-4580 FAX: (905) 336-8901 E-mail: water.levels@ec.gc.ca http://www.on.ec.gc.ca/glimr/

Peter Yee Great Lakes-St. Lawrence Regulation Office 111 Water Street East Cornwall, ON K6H 6S2 Tel. (613) 938-5725 E-mail: peter_yee@pch.gc.ca

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Editor, Chuck Southam

Aussi disponible en français

June Precipitation Over the Great Lakes As a percentage of the long-term June average:

Great Lakes Basin 96% Lake Erie 57%
Lake Superior 106% (including Lake St. Clair)
Lakes Michigan-Huron 96% Lake Ontario 119%

NOTE: These figures are preliminary

Claire (station #15330), for Lake St. Louis, and Sainte-Anne-de-Bellevue (station #16005), for Lake of Two Mountains. These two stations add to the already existing 18 water level observation stations along the St. Lawrence River and also the 56 tidal prediction stations across Canada.

To get water level information from these stations, dial the toll-free number 1-877-775-0790. A new section covering tides, currents and water level information will soon be posted on the CHS web site at www.charts.gc.ca.

U.S. Water Level and Meteorological Data

The National Oceanic and Atmospheric Administration (NOAA), National Ocean Service (NOS), Center for Operational Oceanographic Products and Services (CO-OPS) has placed in operation a real-time water level information service for 2002. This service "Great Lakes Online" is a product that provides users with the latest information from NOAA's gauging network in the Great Lakes. Real-time water level (updated every six minutes) and meteorological data are provided to users via the Internet or an interactive telephone response system.

To access this information on the Internet go to:

www.glakesonline.nos.noaa.gov

Internet users may select their water level station of interest by selecting the "State Maps" or "Stations List" option on the main menu. To access the information via phone, dial 1-301-713-9596 (a toll number) and follow the directions on the interactive telephone response system.

June Outflows From the Great Lakes

As a percentage of the long-term June average:

Lake Superior 97% Lake Erie 99% Lake Huron 89% Lake Ontario 109%.

LEVEL news Great Lakes - St. Lawrence River

Water Levels

Volume 10, Number 8

August 9, 2002

Seasonal Rise Likely to Continue on Lake Superior during August Two Public Events Scheduled for September

Monthly mean water levels on lakes Superior and Michigan-Huron increased slightly from June to July. Trends in daily water levels, however, suggest that Lakes Michigan-Huron have peaked for the year, whereas Lake Superior will continue its seasonal rise during August.

Lake Superior will likely see a small increase in water levels during August. Monthly levels usually peak in September on Lake Superior. Daily levels were fairly stable on Lakes Michigan-Huron during July. Levels on these lakes will likely decline a few centimetres during August as they begin their seasonal decline. Having peaked during June, water levels on lakes St. Clair, Erie and Ontario are expected to continue to decline during August.

At the beginning of August, lakes Superior and Michigan-Huron were 15 and 27 cm below average, respectively. Lakes St. Clair and Erie began the month 8 and 6 cm

below average, whereas Lake Ontario level was 13 cm above average. Present levels on each of the Great Lakes, except Lake Superior, remain 18 to 30 cm higher than those of one year ago. Lake Superior is at about the same level as it was last year.

Montréal Harbour's monthly mean water level was 6.55 m during July; just 3 cm higher than its 1967-2001 period-of-record average level for the month, but 115 cm higher than it was during July 2001.

Study Board and Public Interest Advisory Group Release Year 1 Reports to the International Joint Commission

The International Lake Ontario - St. Lawrence River Study Board and the Public Interest Advisory Group (PIAG) will release two comprehensive Year 1 progress reports to the International Joint Commission (IJC) on August 14, 2002. The Study Board Year 1 report summarizes activities completed in the first year of a 5-year, bi-national water level study of Lake Ontario and the St. Lawrence River. The PIAG Year 1 report was developed to ensure that the public's impressions, opinions and feedback were accurately captured from the very beginning of the Study.

The Study Team emphasizes that there is a great deal of work ahead to complete the 5-year, IJC project and that public participation is critical to the evaluation and assessment of current water level regulation in Lake Ontario and the St. Lawrence River. To ensure that the study reflects the interests of the public, the PIAG will continue to schedule frequent public meetings in various locations in the Lake Ontario and St. Lawrence River area. Upcoming meetings will be held in Ogdensburg, New York, Belleville, Ontario and Trois-Rivières, Quebec.

More information, including the full text of the reports, may be found on the Study's website at: **www.losl.org**, or by contacting Amanda Morelli in Canada at (613) 992-5727 or Arleen Kreusch in the U.S. at (716) 879-4438.







Asian Carp Threaten Great Lakes Warns IJC

In a letter to the governments of the United States and Canada the International Joint Commission (IJC) states that immediate action must be taken by the two governments to prevent Asian carp from invading the Great Lakes in the near future. Scientists caution that failure to prevent the invasion of Asian carp may result in damage to the Great Lakes ecosystem far . exceeding those brought about by the previous invasions of the sea lamprey and the zebra mussel.

For more information about this issue, including a copy of the IJC's letter, please visit the IJC website at: www.ijc.org.

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Editor, Chuck Southam Aussi disponible en français

July Precipitation Over the Great Lakes As a percentage of the long-term July average:

76% 81% Lake Erie **Great Lakes Basin** (including Lake St. Clair) 87% Lake Superior Lake Ontario 81% 78% Lakes Michigan-Huron

NOTE: These figures are preliminary

Public Meeting

On September 19, 2002 in Ogdensburg, New York, the International Lake Ontario -St. Lawrence River Study Board and the International St. Lawrence River Board of Control will be hosting a joint public meeting at the Quality Inn Gran-View from 7:00 p.m. to 9:00 p.m. If you would like to attend the meeting, please contact Amanda Morelli in Canada at (613) 992-5727 or Arleen Kreusch in the U.S. at (716) 879-4438 to RSVP.

Open House

Lake Huron

The International Niagara Board of Control will hold an open house during the evening of Monday, September 16, 2002 at the Four Points/Sheraton Hotel, 114 Buffalo Avenue. Niagara Falls, New York. The purpose of this open house is to inform the public of the Board's current activities and to hear public comments and suggestions

regarding the Board's work. In addition, information will be presented on Great Lakes water levels. The open house is scheduled to begin at 7:30 p.m. If you require additional information, please contact Len Falkiner at: (905) 336-4947.

95%

Lake Ontario 110%

July Outflows From the Great Lakes

As a percentage of the long-term July average: Lake Superior 97% Lake Erie

LEVEL news Great Lakes - St. Lawrence River



Volume 10, Number 9

September 9, 2002

Lake Superior Likely Near Its Peak Level for the Year Lake Ontario's Level Experiences Notable Decline

Water levels on lakes
Michigan-Huron, St. Clair,
Erie and Ontario continued to
decline from July to August.
While levels on lakes
Michigan-Huron, St. Clair
and Erie fell by near-average
amounts, the drop in Lake
Ontario's level was more
than twice the usual amount.

Lake Superior's monthly mean water level rose 4 cm from July to August.
Although this increase in levels was about average, a 1 cm decline in daily levels was experienced from the beginning to the end of August suggesting that the lake is near its peak for the year.

The levels of lakes Michigan-Huron, St. Clair, and Erie fell by near-average amounts from July to August declining by 1, 5, and 9 cm, respectively. Lake Ontario levels declined 28 cm from July to August, more than twice its usual amount and a few centimetres more than had been expected. The larger than average decline resulted from the combination of lower than average supplies and higher than average outflows.

The levels on all lakes are now below their long-term averages. At the beginning of September, lakes Superior and Michigan-Huron were 17 and 27 cm below average, respectively. Lakes St. Clair, Erie and Ontario began the month 8, 11, and 5 cm below average, respectively.

Lake Superior is expected to remain at about the same level in September as it was in August. The levels of lakes Michigan-Huron, St. Clair, Erie and Ontario are expected to continue to decline.

Montréal Harbour's monthly mean water level was 6.05 m during August; 50 cm above chart datum, but 35 cm below the 1967-2001 average level for the month.

Public Meeting Announcement

There will be an open house on Wednesday, October 30, 2002 from 7:00 to 9:00 pm at the Ramada Inn located at 11 Bay Bridge Road in Belleville, Ontario to discuss the Lake Ontario – St. Lawrence River Study. The open house will be hosted by the Public Interest Advisory Group (PIAG), on behalf of the International Lake Ontario – St. Lawrence River Study Team and is supported by Quinte Watershed Cleanup Inc. and the Lower Trent, Cataraqui and Toronto Conservation Authorities.

The PIAG is a committee of 22 U.S. and Canadian volunteers working to ensure effective two-way communication with the public and the study team. There is a great deal of work ahead to complete the 5-year project and public participation is critical to the evaluation and assessment of current water level regulation in the basin.

For more information about the study visit: **www.losl.org**. Should you have any questions or concerns, please contact Amanda Morelli in Canada at (613) 992-5727 or Arleen Kreusch in the U.S. at (716) 879-4438.

Lake Ontario Update

Since reaching its seasonal peak in June about 30 cm above average, Lake Ontario's water level has been declining at a faster than usual rate due to the hot, dry weather conditions and outflows higher than those specified by the lake's regulation plan. By late August, the lake's level had returned to average and at the beginning of September was 5 cm below average.

This year to-date, the International St. Lawrence River Board of Control, which oversees Lake Ontario outflow regulation, has authorized eight short-term increases in the Lake Ontario's outflow to meet critical hydropower needs. These increases, typically lasting four to eight hours, enabled the hydropower

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Editor, Chuck Southam

Aussi disponible en français

August Precipitation Over the Great Lakes As a percentage of the long-term August average:

Great Lakes Basin 93% Lake Erie 51%
Lake Superior 98% (including Lake St. Clair)
Lakes Michigan-Huron 111% Lake Ontario 57%

NOTE: These figures are preliminary

entities in the St. Lawrence River to increase their power generation to help meet increased electrical demand during heat wave conditions. The Board also authorized two flow increases, one just prior to and the other immediately following the Labour Day weekend, to assist navigation at the Port of Montréal. These shortterm flow increases, along with the Board's program of outflows more than specified by the regulation plan during the summer, have reduced the 7.9 cm of water that the Board had previously retained on the lake to zero centimetres.

Ever Wondered Why?

Every now an again
LEVELnews reminds its
readers to check the Canadian
Hydrographic Service's
Monthly Water Levels
Bulletin for the latest sixmonth water level forecast.
Have you ever wondered why
the current edition of the
Bulletin has the previous

month's date on it? The reason the bulletin is dated one month earlier than the month it is produced and distributed in is the result of a naming convention frequently used for products that contain water level or similar types of data. The August 2002 date on the current bulletin (that is, the one produced and distributed during September) signifies that it includes recorded water level data up to and including August 2002.

August Outflows From the Great Lakes

As a percentage of the long-term August average:

Lake Superior 94% Lake Erie 93% Lake Huron 91% Lake Ontario 106%

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LEVEL news Great Lakes - St. Lawrence River



Volume 10, Number 10

October 8, 2002

Storm Season Approaching

Below Average Water Supplies Received by All Lakes Except Lake Superior

Water supplies were below average to all lakes, except Lake Superior, during September. Lake Superior received above average water supplies during September, and, as a result its monthly mean water level rose 2 cm from August to September.

Lakes Michigan-Huron, St. Clair, Erie and Ontario received below average water supplies during September. Monthly mean water levels on these lakes fell 8, 11, 11 and 26 cm, respectively, from August to September. While the declines recorded on lakes Michigan-Huron. St. Clair and Erie were 2 to 4 cm more than average: Lake Ontario levels fell almost twice as much as usual for the second month in a row.

The seasonal decline in lakes St. Clair, Erie and Ontario levels stalled, although only briefly, as the remnants of Hurricane Isidore passed over the lower Great Lakes basin. Heavy rains on September 27th caused daily water levels on these three lakes to increase by 2 to 3 cm by the 28th. The increase was short lived, however, as levels began to decline again on the 29th.

Water levels on all of the Great Lakes remain below average. All lakes began October at levels higher than those of one year ago, however, Lake Ontario was just 2 cm high than it was last year. Lake Superior is near its annual peak and should begin its seasonal decline during October. Lakes

Michigan-Huron, St. Clair, Erie and Ontario are expected to continue their seasonal declines during October.

The level at Montréal Harbour declined in September, falling further below its long-term average and below chart datum in the later half of the month. Montréal Harbour levels averaged 5.56 m during September; 1 cm above chart datum and 76 cm below the long-term average for the month. Daily levels at the harbour ranged from a high of 5.82 m on the 5th to a low of 5.40 m on the 30th. If the dry conditions continue the harbour's level will remain below chart datum during October.

Storm Season Reminder

Autumn often brings storms packing high winds to the Great Lakes region. When strong winds prevail in one direction over a lake for a number of hours, they produce a surface tilt referred to as a storm surge. At the eastern end of Lake Erie, for example, this wind set-up can cause the water level to temporarily rise over two metres. While the continuing below-average water level conditions throughout the Great Lakes system will help reduce the risk of serious flood and erosion damage to shore property due to short-term increases in water levels, LEVEL*news* readers are reminded to exercise caution when at or near the water's edge during a storm event.



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Joint Public Meeting Draws Large Crowd

Over 100 people attended the public meeting hosted jointly by the International Lake Ontario - St. Lawrence River Study Board and the International St. Lawrence River Board of Control in Ogdensburg, New York on September 19, 2002. The meeting began with formal presentations by representatives of both Boards. The Board presentations were followed by an open question and answer period, which enabled those in attendance to share their views and concerns with each other and the Boards. The recent decline in water levels in the upper St. Lawrence River was raised as a notable issue of concern by those in attendance.

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Editor, Chuck Southam

Aussi disponible en français

September Precipitation Over the Great Lakes As a percentage of the long-term September average:

Great Lakes Basin 85%
Lake Superior 119%
Lakes Michigan-Huron 59%

Lake Erie 103% (including Lake St. Clair) Lake Ontario 87%

NOTE: These figures are preliminary

Last Edition for Seasonal Subscribers

For those of you who are on our mailing list for the Water Level Bulletin and LEVELnews for the six months from spring to fall only, this is the last edition you will receive this year. You will automatically start receiving both publications again in May 2003. If you would like to check water level conditions between now and then, please feel free to call us at one of the telephone numbers provided in the For More Information box, or contact the Canadian Hydrographic Service at the telephone number shown on the Bulletin. If you prefer, you can access water level and related information through the OUR GREAT LAKES site at: www.on.ec.gc.ca/water/ greatlakes/intro-e.html

No Longer Need Water Level Information Year-round?

If you are on the year-round subscription mailing list, but have found that you only read the Water Level Bulletin and LEVELnews from spring to fall, please consider switching to a seasonal subscription. Moving to the seasonal mailing list will help us reduce costs and eliminate waste. If you would like to switch, just let us know.

September Outflows From the Great Lakes

As a percentage of the long-term September average:

Lake Superior 95%
Lake Huron 91%

Lake Erie 92% Lake Ontario 96%

LEVEL news Great Lakes - St. Lawrence River

NEWS Lawrence River Water Levels

Volume 10, Number 11

November 8, 2002

Greater Than Average Decline Seen on Most Lakes Lake Superior Levels Appear to Have Peaked for the Year

Monthly mean water levels on Lake Superior increased 2 cm from September to October; however, trends in daily water levels experienced during October, suggest that the lake has peaked for the year and has joined the other Great Lakes in their annual seasonal decline.

Lakes Michigan-Huron, St. Clair, Erie and Ontario continued their seasonal decline during October. Monthly mean water levels on these lakes fell 10, 12, 9 and 16 cm, respectively, from September to October. The declines experienced on lakes Michigan-Huron, St. Clair and Ontario were 3 cm more than average. Lake Erie's decline was 1 cm less than the average amount.

Water levels on all of the Great Lakes remain below average. At the beginning of November, lakes Superior and Michigan-Huron were 10 and 38 cm below average, respectively. Lakes St. Clair,

Erie and Ontario began the month 21, 16, and 17 cm below average. Water levels on all lakes are expected to decline during November, but remain above Chart Datum.

The level at Montréal
Harbour remained below
Chart Datum for all but one
day during October.
Montréal Harbour levels
averaged 5.40 m during
October; 15 cm below Chart
Datum, 97 cm below average,
and a new period-of-record
low for the month.

How Much Have the Lakes Declined So Far This Year?

While it appears that Lake Superior has finally peaked for the year, as LEVEL*news* readers are aware water levels on lakes Michigan-Huron, St. Clair, Erie and Ontario have been declining steadily since peaking in either June or July. Although levels on these lakes are expected to decline further, it is interesting to note how much these lakes have declined as of the beginning of November.

Since the day they peaked during July, daily water levels on lakes Michigan-Huron and St. Clair have declined by 29 and 41 cm, respectively. Both lakes have declined by about 15 cm more than average so far this year. Since peaking in June, daily water levels on Lake Erie have declined by 50 cm—about 20 cm more than average.

The decline in Lake Ontario water levels has been the most notable at almost twice the average amount. Since peaking on June 22nd, Lake Ontario's level has declined 95 cm. While Lake Ontario's level was about 30 cm above average when it peaked in June, at the beginning of November it was 17 cm below average. The larger than average decline experienced so far this year on Lake Ontario is due in the most part to below average water supplies; however, 7 cm of the 95 cm decline is the result of outflows greater than those specified by the lake's regulation plan. These over-discharges have been made under the direction the International St. Lawrence River Board of Control in order to release all of the 5 cm of water previously stored on the lake by the Board and, more recently, to help maintain water levels on the Lake St. Louis and in Montréal Harbour.



Lake-Effect Snow

Increased evaporation from the Great Lakes during the early winter not only causes declines in water levels; it can also lead to significant lake-effect snowfalls in traditional snowbelt areas throughout the region.

Arctic air from the northwest is very cold and dry when it enters the Great Lakes basin, but is warmed and picks ups moisture travelling over the comparatively warmer lakes. When it reaches land, the moisture condenses as snow, creating heavy snowfalls on the lee side of the lakes in areas frequently referred to as snowbelts. It is interesting to note that outside of the Great Lakes region, very few people have ever heard of, or experienced, lake-effect snow.

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Editor, Chuck Southam Aussi disponible en français

October Precipitation Over the Great Lakes As a percentage of the long-term October average:

Great Lakes Basin 108% Lake Erie 69%
Lake Superior 151% (including Lake St. Clair)
Lakes Michigan-Huron 97% Lake Ontario 100%

NOTE: These figures are preliminary

IJC Funds Testing of Potential Second Barrier to Stop Asian Carp

The International Joint
Commission (IJC) has issued
a contract to bring experts
from the United Kingdom to
assist with the collective
efforts to prevent Asian carp,
and other invasive species,
from entering the Great Lakes
through the Chicago canal
that connects the Great Lakes
with the Mississippi River
basin by way of the Illinois
River.

In July the IJC alerted the Governments of the United States and Canada of the need for immediate action to prevent the Asian carp from invading the Great Lakes through the Chicago Sanitary and Ship Canal. Initial results from experiments that are currently being undertaken by the Illinois Natural History Survey indicate that the present electric barrier in the canal

shows promise, but may not be 100 percent effective in preventing the upstream movement of Asian carp. Therefore, other barrier types, such as acoustic and bubble barriers, should also be assessed individually and in conjunction with the electric barrier. The IJC issued the contract to bring experts from Fish Guidance Systems, Ltd. to evaluate the ability of acoustic and bubble barriers to prevent further migration of Asian carp through a series of controlled experiments in hatchery raceways.

October Outflows From the Great Lakes

As a percentage of the long-term October average:

Lake Superior 97% Lake Erie 94% Lake Huron 90% Lake Ontario 94%

A1 T160

LEVEL news Great Lakes - St. Lawrence River



Volume 10, Number 12

December 6, 2002

Below Average Supplies Lead to Above Average Declines

Water supplies to all of the Great Lakes were below average during November. Water supplies to Lakes Superior and Michigan-Huron were particularly low. As a result of the low supplies, the monthly mean levels of all of the lakes fell by more than average from October to November.

Water levels on all of the Great Lakes remain below average. Lake Superior began November 14 cm below its long-term average and 2 cm higher than it was at the same time last year. Lakes Michigan-Huron began the month 44 cm below

average, 3 cm below chart datum and 9 cm lower than it was one year ago. Lakes St. Clair, Erie and Ontario began November around 20 cm below average. These lakes began December 14, 2 and 16 cm lower than they were last year, respectively.

The level at Montréal Harbour remained below chart datum for all but 5 days during November. Montréal Harbour levels averaged 5.44 m during the month; 11 cm below Chart Datum, 106 cm below the 1967-2001 November average, and a new period-of-record low for the month.

Water levels on all lakes are expected to decline during December; however, lakes Erie and Ontario are likely nearing the end of their seasonal declines and should begin to level out over the next several weeks. Montréal harbour is expected to remain below average and below chart datum during the month of December.

Lake Erie-Niagara River Ice Boom

Each year since 1964, Ontario Power Generation and the New York Power Authority have installed the continued on next page)

Seasonal Temperature and Precipitation Forecasts on the Internet

Environment Canada's seasonal temperature and precipitation forecast package can be found on the Internet at: http://weatheroffice.ec.gc.ca/saisons/index_e.html.

If you visit the forecast package site you will find the latest information on:

- Current temperature and precipitation forecasts;
- Skill of the forecast system;
- Verification of past forecasts;
- Observed climatology of temperature and precipitation; and
- Continental snow coverage, sea ice coverage, and sea surface temperature anomalies.

The site also includes links to the Environment Canada El Niño and La Niña pages. The ENSO phenomena (El Niño and La Niña) is one of the major factors influencing the year-to-year fluctuations of seasonal temperature and precipitation anomalies in Canada. You can learn more about the worldwide and regional effects of the phenomena as well as follow its evolution by going to the Environment Canada El Niño and La Niña web pages.



Canadä^{*}

Lake Erie-Niagara River Ice Boom at the head of the Niagara River. The use of the ice boom is authorized by the International Joint Commission and is overseen by the Commission's International Niagara Board of Control.

The boom, which is 2700 m long, is made up of floating steel pontoons joined together to form 22 linked spans that are attached to the bottom of Lake Erie by steel cables. The purpose of the boom is to accelerate the formation of an ice arch that naturally forms in the eastern end of Lake Erie most winters and stabilize the icecover once it forms. The boom also reduces the severity and duration of lake ice entering the Niagara River as the result of storms over

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Editor, Chuck Southam

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November Precipitation Over the Great Lakes As a percentage of the long-term November average:

Great Lakes Basin 76% Lake Erie 123%
Lake Superior 52% (including Lake St. Clair)
Lakes Michigan-Huron 67% Lake Ontario 100%

NOTE: These figures are preliminary

the lake. It lessens the probability of large-scale ice blockages in the river that can lead to hydropower generation reductions, shoreline flooding and property damage.

Installation of the boom spans can begin on whichever comes first: December 16th, or when the Lake Erie water temperature as measured at the Buffalo Water Intake declines to 4°C. On average, the boom has been opened during the first week in April; however, last season the boom was completely opened and removed on March 7th since an ice cover had not formed on Lake Erie. This was the third year in the past 50 years, but the second in the past five years, that an ice cover did not form on Lake Erie. To date, the earliest and latest dates for ice boom opening have been March 5, 1998 and May 3, 1971, respectively.

For more information on the Lake Erie-Niagara River Ice Boom please visit the International Niagara Board of Control's website at: http://huron.lre.usace.army.mil/ijc/niagara.html

Seasons Greetings

Everyone involved in the preparation and distribution of LEVEL*news* would like to wish you a happy Holiday Season and a safe and prosperous New Year.

November Outflows From the Great LakesAs a percentage of the long-term November average:

Lake Superior 100% Lake Erie 93% Lake Huron 89% Lake Ontario 94%

Great Lakes - St. Lawrence River



Volume 11, Number 1

January 9, 2003

December Supplies Below Average on All Lakes Except Erie Water Level Information Table Added as New Feature

Starting this month, LEVELnews will have a new feature. In place of the highlight box previously provided at the bottom of the first page, a table summarizing current Great Lakes water level conditions can now be found. By referring to this table, readers will, at a glance, be able to see how monthly mean water levels for the previous month and water levels at the beginning of the current month compare to their respective long-term average values as well as levels recorded at the same time one year ago.

Current Conditions

December water supplies were below average on the lakes Superior, Michigan—Huron and Ontario basins. Although the December local basin supply was well above average on Lake Erie, the total supply to this lake was just slightly above average due to the below average inflows it received from Lake Huron.

Monthly mean water levels on all of the lakes fell by a few centimetres more than average from November to December. Daily water levels also declined from the beginning to the end of December on all lakes, except Lake Erie. Daily levels on Lake Erie increased by 5 cm during December in response to the above average supplies received by this lake during the month.

Water levels on all of the Great Lakes remain below their long-term average levels for this time of year and are lower than those of one year ago. Water levels are notably low on Lakes Michigan-Huron, which began January 47 cm below average and 12 cm below chart datum. (continued on next page)

Great Lakes Water Level Information						
	December Monthly Mean Level		Beginning of January Level			
Lake	Compared to Monthly Average (1918-2001)	Compared to One Year Ago	Compared to Beginning-of-Month Average (1918-2001)	Compared to One Year Ago		
Superior	16 cm below	4 cm below	16 cm below	6 cm below		
Michigan-Huron	47 cm below	14 cm below	47 cm below	14 cm below		
St. Clair	30 cm below	12 cm below	27 cm below	9 cm below		
Erie	17 cm below	6 cm below	13 cm below	2 cm below		
Ontario	20 cm below	20 cm below	21 cm below	19 cm below		

The monthly mean level at Montréal Harbour remained below chart datum during December, and set a new record December minimum for the period since 1967.

The levels of lakes Superior and Michigan-Huron are expected to continue to decline during January. Recent trends in daily water levels observed on lakes Erie and Ontario suggest these lakes are at, or near, their annual minimum levels. Water levels on these lakes will likely remain stable or rise slightly during January.

Water Supplies to the Great Lakes

More change is on the way. In order to better explain the ups and downs in water levels, watch for LEVEL*news* to have an increased focus on the monthly water supplies to each of the Great Lakes.

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Editor, Chuck Southam

Aussi disponible en français

December Precipitation Over the Great Lakes As a percentage of the long-term December average:

Great Lakes Basin 72% Lake Erie 120%
Lake Superior 67% (including Lake St. Clair)
Lakes Michigan-Huron 52% Lake Ontario 76%

NOTE: These figures are preliminary

While precipitation, which is often noted, is one component of the water balance equation, net basin supply and net total supply are better indicators of hydrologic conditions affecting lake levels. Net basin supply (often referred to as the local basin supply) is the combined effect of over-lake precipitation, basin runoff and evaporation from the lake's surface. The net total supply, or more simply, the total supply to a lake consists of the net basin supply for the lake plus its inflow from the upper lakes as applicable.

The water level of each of the Great Lakes depends on the balance between the total water supplies received by a lake and its outflow (or discharge). If the water supplies received by the lake are greater than those discharged, its level will rise. Conversely, if the water supplies are less than the discharge, the lake's level will fall.

Lake Erie-Niagara River Ice Boom

Installation of the Lake Erie-Niagara River Ice Boom was completed on December 12th. Preparations for span placement began on December 2nd when six floatation barrels were installed. Eight barrels were installed on the 3rd and the final nine were placed on the 4th. All strings of pontoons were removed from their summer storage area and placed behind the Buffalo Harbor breakwater by December 9th. Installation of the ice boom's 22 spans followed on the 11th and 12th.

December Outflows From the Great Lakes

As a percentage of the long-term December average:

Lake Superior 102% Lake Huron 90%

Lake Erie 95% Lake Ontario 92%

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Great Lakes - St. Lawrence River



Volume 11, Number 2

February 7, 2003

Water Levels on Middle Lakes Similar to Those in 2001

After moving closer to their long-term average levels last summer, the middle lakes lakes Michigan-Huron, St. Clair and Erie—have fallen to the same levels as they were at the beginning of February 2001. Although specific details differ by lake, simply put, the greater than average seasonal declines experienced so far this year on the middle lakes have erased the recovery in levels noticed on them last summer. A detailed discussion tracing changes in Lakes Michigan-Huron water levels over the past two years is provided on the back page of this month's LEVELnews.

Water levels throughout the Great Lakes are expected to continue to decline during February, although all lakes, except Lake Superior, are likely nearing the end of their annual seasonal decline. Lake Superior, the most northerly lake, generally begins its seasonal rise a month or more later than the other lakes.

Unless very wet conditions are experienced, water levels are expected to remain below average on each of the Great Lakes over the next six month and likely lower than they were during 2002.

Water levels on the middles lakes will likely be similar to,

or possibly lower than, those experienced during 2001. No new record lows are expected on the lakes at this time. however, near-record low levels on Lakes Michigan-Huron are possible. If wet conditions return to the basin. lakes Erie and Ontario could recover to near average levels. Lakes Superior and Michigan-Huron levels: however, would still remain below average even if high water supplies are received over the next six months. Be sure to check the Monthly Water Levels Bulletin each month for the latest 6-month water level forecast for each lake.

Great Lakes Water Level Information					
	January Monthly Mean Level		Beginning of February Level		
Lake	Compared to Monthly Average (1918-2001)	Compared to One Year Ago	Compared to Beginning-of-Month Average (1918-2001)	Compared to One Year Ago	
Superior	19 cm below	6 cm below	22 cm below	7 cm below	
Michigan-Huron	53 cm below	17 cm below	55 cm below	17 cm below	
St. Clair	25 cm below	9 cm below	21 cm below	23 cm below	
Erie	16 cm below	3 cm below	22 cm below	18 cm below	
Ontario	22 cm below	23 cm below	28 cm below	30 cm below	



Lakes Michigan-Huron

In the next few paragraphs we'll review, in some detail, what has happen to water levels on Lakes Michigan-Huron over the past two years to get them to where they are today; 55 cm below average, at virtually the same level as they were at the beginning of February 2001.

After declining from near-record high levels in mid-1997, at the beginning of February 2001 Lakes
Michigan-Huron were about 56 cm below average. Levels on the lakes rose a bit more than average during the spring of 2001, peaking in late-June, 51 cm below their long-term average, a 5 cm improvement relative to average compared to February conditions.

After peaking, the lakes began a slow seasonal decline; however, thanks to a damp, mild fall, the 2001 seasonal decline stalled and, in fact, periodically reversed from mid-September to late-December. A dramatic shift to colder weather in late December caused increased evaporation from the lakes and levels resumed their seasonal decline during January and first three weeks of February 2002. When the lakes ended their seasonal

January Precipitation Over the Great Lakes As a percentage of the long-term January average:

Great Lakes Basin 59% Lake Erie 63%
Lake Superior 61% (including Lake St. Clair)
Lakes Michigan-Huron 51% Lake Ontario 75%

NOTE: These figures are preliminary

decline on February 19th they had only declined 17 cm in total since peaking in June 2001, 11 cm less than the long-term decline average for this period of time. As a result, on February 19th the lakes were 40 cm below average, 16 cm closer to average than they were at the beginning of February 2001.

Water level conditions continued to improved during the first half of 2002. A wet spring resulted in a 43 cm seasonal rise in levels between February 19th and July 9th, when water levels peaked for the year, an increase of about 14 cm more than average. Therefore, when the daily water levels peaked in July 2002 they were still 26 cm below average, but 30 closer to average than they were at the beginning of February 2001. Most notable to recreational boaters and others was the fact that summer 2002 levels were 25 cm or more higher than they were during the summer of 2001.

Unfortunately, dry conditions since July combined with below average inflows from Lake Superior and significant evaporation from the lakes so far this fall and early winter have lead to very low water supplies to Lakes Michigan-Huron. Since peaking in July 2002, water levels have declined by 57 cm so far this year, about 29 cm more than average, effectively erasing the 30 cm recovery in levels experienced between February 2001 and July 2002.

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Editor, Chuck Southam

Aussi disponible en français

January Outflows From the Great Lakes

As a percentage of the long-term January average:

Lake Superior 99% Lake Huron 98% Lake Erie 93% Lake Ontario 93%

LEVELnews



Great Lakes - St. Lawrence River Water Levels

Volume 11, Number 3

March 7, 2003

Ice Conditions Impact Lake St. Clair Water Levels Cold Temperatures Promote the Formation of Ice

Temperatures well below normal were reported throughout the Great Lakes region during much of February. As a result, at the beginning of March only large portions of lakes Michigan and Ontario remained ice free. The extensive ice cover will reduce or prevent further evaporation of water from the lakes and help bring an end to their seasonal decline in water levels.

Water levels on all of the Great Lakes continued to decline during February. As indicated in the attached water level information table, at the beginning of March,

water levels on all lakes were well below their long-term average levels and much lower than they were last year. Water levels on all lakes, except Lake Superior, are also lower than they were at the same time during 2001.

Although many of the water level differences provided in the table are notable, two values (shown in bold) warrant further discussion. As indicated, water levels on Lakes Michigan-Huron began March, 59 cm below average. This value accurately reflects the present water condition on these lakes relative to average. The 46 cm value shown for Lake St. Clair,

however, may not truly reflect the lake's relative water level condition. Daily water levels on Lake St. Clair have been varying significantly since mid-February in response to ice conditions on the lake and in the St. Clair and Detroit rivers. Once ice conditions ease and water levels stabilize, we will be able to get a better idea of how Lake St. Clair levels compare to average. It must be noted, however, that Lake St. Clair daily levels can also be affected by the volume and timing of spring runoff from its local drainage basin.

Great Lakes Water Level Information					
	February Monthly Mean Level		Beginning of March Level		
Lake	Compared to Monthly Average (1918-2001)	Compared to One Year Ago	Compared to Beginning-of-Month Average (1918-2001)	Compared to One Year Ago	
Superior	22 cm below	7 cm below	23 cm below	8 cm below	
Michigan-Huron	58 cm below	20 cm below	59 cm below	23 cm below	
St. Clair	19 cm below	17 cm below	46 cm below	39 cm below	
Erie	24 cm below	24 cm below	26 cm below	24 cm below	
Ontario	29 cm below	39 cm below	32 cm below	45 cm below	

Water Level Outlook

Lake Superior is expected to continue its seasonal decline during March while Lakes Michigan-Huron will likely remain relatively level for the next few weeks. Lakes St. Clair, Erie, and Ontario should begin their seasonal rise in the coming weeks. Please refer to the Monthly Water level Bulletin for the latest 6-month water level forecast.

Lake Erie-Niagara River Ice Boom

The Lake Erie-Niagara River Ice Boom had 12 of its 22 spans forced open as the result of a storm event over the Buffalo/Fort Erie area on February 4th. This is the greatest number of spans opened by storm action since the boom was initially installed in 1964. Although lake ice entered the Niagara

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Editor, Chuck Southam

Aussi disponible en français

February Precipitation Over the Great Lakes As a percentage of the long-term February average:

Great Lakes Basin 58% Lake Erie 66%
Lake Superior 43% (including Lake St. Clair)
Lakes Michigan-Huron 50% Lake Ontario 92%

NOTE: These figures are preliminary

River for several hours, there was no ice jamming, instances of flooding or reports of shoreline property damage.

Each span of the boom is made up of floating steel pontoons anchored to the lake bed at 122 m intervals by a 6.4 cm diameter steel cable. The pontoons are 76 cm in diameter and 9 m long. In addition to opening spans, pressure from the ice detached around 10 percent of the pontoons and several floatation barrels. These were retrieved from the upper Niagara River once the storm subsided. Repairs to damaged components of the boom and re-attachment of the spans were completed on February 26th.

Ripple Effects Newsletter

The third volume of the International Lake Ontario - St. Lawrence River Study's newsletter *Ripple Effects* is now available in hard copy

and on-line at:
www.losl.org/news/Ripple
Effect_jan2003-e.html.

If you would like to receive a printed copy of *Ripple Effects* by mail, please contact the Study's Public Information Officer at (613) 992-5727.

Now a quarterly publication, expect to receive LOSL news more often!

91%

February Outflows From the Great Lakes

As a percentage of the long-term February average:

Lake Superior92%Lake ErieLake Huron96%Lake Ontario

LEVEL news



Great Lakes - St. Lawrence River Water Levels

Volume 11, Number 4

April 7, 2003

Low Water Level Conditions Continue,

But All Lakes Appear to Have Started their Annual Seasonal Rise

After experiencing seasonal declines as much as twice their average amounts this past fall and winter, it appears that the Great Lakes are into their annual seasonal rise for 2003.

After remaining fairly stable during the first half of the month, daily levels on lakes Erie and Ontario increased 14 and 25 cm, respectively, during the last half of March. These increases were large enough to cause the monthly mean water levels on these two lakes to increase about 5 cm from February to March. Although monthly

levels declined from February to March on lakes Superior, Michigan-Huron and St. Clair upward trends in their daily water levels during the last week of March suggest they have also started their annual seasonal rise.

As indicated in the water level information table, levels on all lakes remain well below their long-term average and lower than they were at the same time last year. Although still several centimetres above their period-of-record low levels, the monthly mean levels recorded this year on lakes

Michigan-Huron, Erie and Ontario during February and March were the lowest they have been since 1965.

Water Level Outlook

Water levels are expected to continue to rise throughout the Great Lakes system during April. Unless very wet conditions are experienced over the next six months, water levels on each of the Great Lakes, except Lake Ontario, are expected to remain well below average and lower than they were during 2002. Water levels will likely be similar to, or (continued on next page)

Great Lakes Water Level Information						
	March Monthly Mean Level		Beginning of April Level			
Lake	Compared to Monthly Average (1918-2002)	Compared to One Year Ago	Compared to Beginning-of-Month Average (1918-2002)	Compared to One Year Ago		
Superior	22 cm below	8 cm below	19 cm below	3 cm below		
Michigan-Huron	61 cm below	26 cm below	59 cm below	23 cm below		
St. Clair	38 cm below	27 cm below	33 cm below	18 cm below		
Erie	28 cm below	24 cm below	26 cm below	22 cm below		
Ontario	32 cm below	44 cm below	21 cm below	29 cm below		





possibly lower than, those experienced during 2001, a time when low lake levels affected recreational boating interests. No new record lows are expected on the lakes at this time, however, near-record low levels on lakes Michigan-Huron and St. Clair are possible if dry conditions persist. If wet conditions return to the basin, Lake Ontario could recover to near average levels sometime this summer.

Be sure to check the Monthly Water Levels Bulletin each month for the latest 6-month water level forecast for each lake.

Ice Boom Removal Delayed past April 1

Ice cover conditions on the eastern end of Lake Erie and the amount of ice below Niagara Falls delayed the

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Editor, Chuck Southam

Aussi disponible en français

March Precipitation Over the Great Lakes As a percentage of the long-term March average:

Great Lakes Basin 78% Lake Erie 71%
Lake Superior 61% (including Lake St. Clair)
Lakes Michigan-Huron 83% Lake Ontario 92%

NOTE: These figures are preliminary

removal of the Lake Erie-Niagara River Ice Boom beyond April 1st.

Representatives of the International Niagara Board of Control will continue to monitor the ice conditions to determine when boom opening can commence. A media advisory will be issued by the Board to inform the public when this year's boom opening begins.

LEVEL*news* also available on the Internet

An electronic version of LEVELnews is posted on the Internet around the 8th or 9th of each month. You can read the LEVELnews text directly on your computer's screen or you can open, view and print an Adobe Portable Document Format (or PDF) version. When printed, the PDF version has virtually the same look and feel as the one distributed by mail.

Current and past editions of LEVEL*news* can be found at:

http://www.on.ec.gc.ca/water/level-news/intro-e.html

Once you've read LEVELnews, be sure to review to the latest Monthly Water Level Bulletin. The Bulletin can be accessed by using its link provided on the LEVELnews website or going to:

http://chswww.bur.dfo.ca/danp/wlgraphs_e.html

March Outflows From the Great Lakes

As a percentage of the long-term March average:

Lake Superior 88% Lake Huron 89%

Lake Erie 91%
Lake Ontario 82%

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EVEL news



eat Lakes - St. Lawrence River Water Level

Volume 11, Number 5

May 9, 2003

Water Levels Increase as the Lakes Continue Their Seasonal Rise

Last month's precipitation combined with snowmelt runoff caused monthly mean water levels to increase on all of the Great Lakes from March to April. During the month of April itself, water levels rose 5 cm more than average on Lake Ontario, while levels on the remaining lakes increased 1 to 3 cm less than average.

As indicated in the water level information table, water levels on all lakes remain well below their long-term average and lower than they were at the same time last year. Lake Ontario levels moved a bit closer to average during April. Since levels

increased less than average on the other lakes, however, they began May a bit further below average than they were at the beginning of April.

Water levels are expected to continue to rise during May. However, since water levels on each of the lakes declined by much more than average this past fall and winter, it will take greater than average increases this spring to help water levels recover. With little or no snow remaining on the basin to generate further snowmelt runoff, greater than average precipitation will be needed to help fuel this year's seasonal rise.

Welcome Back Seasonal Subscribers

LEVELnews would like to welcome back its seasonal subscribers. We hope that you will find LEVELnews and the Monthly Water Levels Bulletin useful sources of information again this year.

Winter 2002/2003

Environments Canada's Climate Trends and Variations Bulletin (CTVB) puts the most recent season in historical context.

Average temperatures and total precipitation are analyzed with respect to 11 broad climatic-geographic (continued on next page)

Great Lakes Water Level Information						
	April Monthly Mean Level		Beginning of May Level			
Lake	Compared to Monthly Average (1918-2002)	Compared to One Year Ago	Compared to Beginning-of-Month Average (1918-2002)	Compared to One Year Ago		
Superior	20 cm below	6 cm below	20 cm below	9 cm below		
Michigan-Huron	61 cm below	24 cm below	61 cm below	28 cm below		
St. Clair	32 cm below	21 cm below	34 cm below	22 cm below		
Erie	25 cm below	24 cm below	27 cm below	25 cm below		
Ontario	16 cm below	26 cm below	15 cm below	28 cm below		

Environnement Canada





regions. The northern portion of the Great Lakes basin within Canada forms part of the Northeastern Forest Climate Region. The Great Lakes/St. Lawrence Climate Region is made up of the southern portion of the Great Lakes basin and the St. Lawrence River valley.

Temperature

Most of Canada had above normal temperatures this winter (December 2002, January 2003, and February 2003). As a whole, Canada experienced its 9th warmest winter since nationwide records began in 1948. There were six regions, which made it to the CTVB's ten warmest winters table. In contrast, only the Great Lakes/St. Lawrence Climate Region made it to the CTVB's ten coolest winters table for this year (10th coolest, 1.0 Celsius degrees below normal).

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April Precipitation Over the Great LakesAs a percentage of the long-term April average:

Great Lakes Basin 86% Lake Erie 67%
Lake Superior 105% (including Lake St. Clair)
Lakes Michigan-Huron 89% Lake Ontario 68%

NOTE: These figures are preliminary

Precipitation

Overall, Canada experienced slightly drier than normal conditions this winter. The Great Lakes/St. Lawrence was the climate region with its driest winter since nationwide records began, 38.9% below normal. Four other regions also made it to the CVTB's ten driest years table including the Northeastern Forest Region (8th driest, 19.3% below normal). To view the complete CTVB, please visit: www.msc.ec.gc.ca/ccrm/ bulletin/

Lake Ontario Outflow Strategy

The dry spell on the Great Lakes basin continues. In consideration of the continued low supplies throughout the Great Lakes, the International St. Lawrence River Board of Control's current Lake Ontario outflow strategy is to conserve water on Lake Ontario, as opportunities arise, for critical needs later in the year and within current operational constraints.

The Board continues to closely monitor the conditions on Lake Ontario and the St. Lawrence River and will intervene as required. The Board intends to review its outflow strategy in May during its regularly scheduled monthly teleconference, or before if conditions require. For more information about the Board and its current outflow strategy, please visit the Board's website at: www.islrbc.org.

April Outflows From the Great Lakes

As a percentage of the long-term April average:

Lake Superior 91%
Lake Huron 83%

Lake Erie 90% Lake Ontario 82%

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EVEL news



eat Lakes - St. Lawrence River Water Levels

Volume 11, Number 6

June 6, 2003

May Rainfall Helps Water Level Conditions Improve on the Lower Lakes Conditions on the Upper Lakes Remain Unchanged

May was a wet month over the lower Great Lakes with the Lake Erie and Lake Ontario basins receiving well above average rainfall. The additional water helped levels improve on both lakes relative to their long-term average conditions.

Water levels on Lake Erie rose 16 cm from the beginning to the end of May. Although this amount may not appear that large, it is about 11 cm more than the long-term average increase recorded on the lake for May. Although water levels on Lake Erie remain below average, they have moved closer to it.

Levels on Lake Ontario rose 27 cm during May, about 18 cm more than average. As a result, water levels on Lake Ontario moved from 15 cm below average at the beginning of May to 3 cm above average at the beginning of June. While most of the increase recorded on Lake Ontario during May was due to the above average rainfall received by the lake, about 4 of the 27 cm increase was the result of outflows slightly below those called for by the lake's regulation plan. These under-discharges were made in accordance with the International St. Lawrence River Board

of Control's current outflow strategy to conserve water on Lake Ontario, for critical needs later in the year.

In contrast to the lower lakes, water level conditions on the upper lakes did not improve relative to their average conditions during May. Since lakes Superior and Michigan-Huron received rainfall amounts closer to average during May, their water levels increased just slightly more than average during the month. As a result, water levels on the upper lakes began June about as far below average as they were at the beginning of May.

Great Lakes Water Level Information						
	May Monthly Mean Level		Beginning of	June Level		
Lake	Compared to Monthly Average (1918-2002)	Compared to One Year Ago	Compared to Beginning-of-Month Average (1918-2002)	Compared to One Year Ago		
Superior	20 cm below	8 cm below	19 cm below	4 cm below		
Michigan-Huron	60 cm below	27 cm below	59 cm below	28 cm below		
St. Clair	31 cm below	21 cm below	23 cm below	14 cm below		
Erie	21 cm below	21 cm below	16 cm below	18 cm below		
Ontario	6 cm below	27 cm below	3 cm above	24 cm below		

IJC Assists in Hydropower Emergency

When the Silver Lake Dam failed on the Dead River near Marquette, Michigan, flood and safety concerns were paramount. The dam failure also had other consequences, one of which was a sudden drop in hydropower production. In other parts of the Upper Peninsula, business operations were forced to shut down due to lack of electric power.

Responding to this situation, the IJC and its International Lake Superior Board of Control authorized increased outflows from Lake Superior to contribute additional hydropower to the Upper Peninsula power grid. The increased outflows are expected to continue into June. Allowing slightly increased outflows from Lake

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Editor, Chuck Southam

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May Precipitation Over the Great Lakes As a percentage of the long-term May average:

Great Lakes Basin 131% Lake Erie 163%
Lake Superior 110% (including Lake St. Clair)
Lakes Michigan-Huron 122% Lake Ontario 160%

NOTE: These figures are preliminary

Superior for a short time has minimal impacts on water levels and flows in the Great Lakes and the St. Marys River while helping offset an electrical system emergency. The Superior Board continues to watch the situation closely.

Open House on June 24th

The International Lake
Superior Board of Control
will hold an open house on the
subject of Lake Superior
outflow regulation, and water
levels in the St. Marys River
and on the Great Lakes. The
open house will be held on
Tuesday, June 24th, from
6:30 p.m. to 8:30 p.m., in the
Russ Ramsay Board Room
(Level 3) of the Civic Centre
at 99 Foster Drive in
Sault Ste. Marie, Ontario.

Open House Scheduled for September 15th

The International Niagara Board of Control will hold an open house during the evening of Monday, September 15th, at the Old Stone Inn, 5425 Robinson Street in Niagara Falls, Ontario.

The purpose of this open house is to inform the public of the Board's current activities and to hear public comments and suggestions regarding the Board's work. In addition, information will be presented on Great Lakes water levels. The open house is scheduled to begin at 7:30 p.m. If you need additional information, please contact Len Falkiner at: (905) 336-4947.

May Outflows From the Great Lakes

As a percentage of the long-term May average:

Lake Superior 94% Lake Erie 92%
Lake Huron 82% Lake Ontario 85%

Government Publications

LEVEL news

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Great Lakes - St. Lawrence River Water Levels

Volume 11, Number 7

July 8, 2003

The Earth Moves—slowly, but surely—in the Great Lakes Region

During the last ice age, which ended some 12 000 years ago, the tremendous weight of the glacier that covered most of the Great Lakes region depressed the earth's crust underneath it and caused the crust to bulge upwards beyond the edge of the ice sheet. When the glacier melted, the crust, relieved of the excess weight began to recover. The earth's crust in the Great Lakes region continues to move today, affecting water depths along the shoreline around each lake.

The ice cover was thicker over the north and east portions of the Great Lakes basin. As a result, the land rises more rapidly there than it does in the south and west portions. In absolute terms, Rossport,

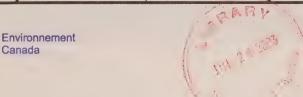
on the north shore of Lake Superior, is rising about 47 centimetres per century (cm/century) relative to centre of the earth as the crust there rebounds. On the other hand, Calumet Harbor, near Chicago at the southern end of Lake Michigan, is subsiding about 11 cm/century as the peripheral bulge collapses. This differential crustal movement and its impact on Great Lakes water levels have been recognized and studied for well over a century.

On an individual lake, how water depths change over time along the shoreline due to differential crustal movement depends on the direction and rate that a particular shoreline location moves relative to the

lake's outlet. Recent estimates. determined at water level gauging stations around each of the lakes, are shown in the figure on the back page. A positive vertical velocity value indicates that the location is rising relative to the outlet, and the lake's surface, over time. A negative value indicates that the site is either falling or not rising as fast as the outlet is. Rossport, for example, is rising about 28 cm/century relative to Lake Superior's outlet and the lake's water surface.

To help visualize the effects of differential crustal movement on the location of the water's edge and its depth along the shoreline, take a bowl and partially fill it with water. (continued on next page)

Great Lakes Water Level Information						
June 2003 Monthly Mean Level		hly Mean Level	Beginning of July 2003 Level			
Lake	Compared to Monthly Average (1918-2002)	Compared to One Year Ago	Compared to Beginning-of-Month Average (1918-2002)	Compared to One Year Ago		
Superior	23 cm below	8 cm below	27 cm below	12 cm below		
Michigan-Huron	59 cm below	29 cm below	58 cm below	32 cm below		
St. Clair	29 cm below	20 cm below	28 cm below	22 cm below		
Erie	15 cm below	16 cm below	15 cm below	12 cm below		
Ontario	8 cm above	21 cm below	6 cm above	22 cm below		



Next, tilt the bowl by slowly raising its upper right hand edge. As you do this, you should be able to notice that although the average level of the water in the bowl doesn't change, the water becomes shallower as it moves further away from the edge being lifted. At the same time, the water becomes deeper as it moves closer to the opposite side of the bowl

What does this mean for property owners and boaters on Georgian Bay with Lakes Michigan-Huron levels currently the lowest they've been since 1964? Since February 2003 to the present. the monthly mean water levels recorded on Lakes Michigan-Huron have been 15 to 24 cm higher than the period-of-record lows of 1964. At the same time however, water depths recorded at Parry Sound for example, have averaged only

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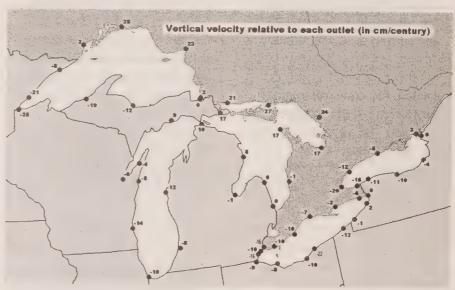
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Editor, Chuck Southam

Aussi disponible en français

5 to 14 cm deeper than they were there in 1964. Why the difference? As indicated in the figure below, Parry Sound is rising about 24 cm/century relative to Lake Huron's outlet at Port Huron/Sarnia. As a result, during the 39 years that have passed since 1964, the Parry Sound area has risen about 10 cm more than the lake's outlet and water surface have. Since the entire Georgian Bay area continues to rise relative to the outlet, depths along its shoreline will continue to decrease for a given lake level as time goes by.

And what about Chicago? Well, as time passes the water there is getting deeper for a given lake level—a good thing during periods of low levels perhaps, but a problem during high water conditions.



Vertical velocity relative to each outlet (in cm/century)

Source: Figure 5 in Apparent Vertical Movement Over the Great Lakes – Revisited. A report prepared by the Coordinating Committee on Great Lakes Basic Hydraulic and Hydrologic Data, November 2001.

Report URL: http://www.geod.nrcan.gc.ca/index_e/pgr_e/PGRgreatLakes_e.html

June Precipitation Over the Great Lakes As a percentage of the long-term June average:

Great Lakes Basin 79% Lake Erie 83%
Lake Superior 65% (including Lake St. Clair)
Lakes Michigan-Huron 82% Lake Ontario 89%

LEVEL nevs Great Lakes - St. Lawrence Rive



Volume 11, Number 8

August 8, 2003

Seasonal Rise Likely to Continue on Lake Superior Alone During August

Monthly mean water levels on all lakes, except Lake Ontario, increased from June to July. Only Lake Superior is expected to continue to climb during August.

Lake Superior rose by about its usual amount from June to July, while levels on lakes Michigan-Huron and St. Clair increased a bit more than they do on average. Lake Erie's level increased 1 cm instead of falling slightly as it usually does. The increases on lakes St. Clair and Erie were small but welcome given the fact that at the beginning of July it appeared that both lakes had already peaked for the year and were on their way down.

Levels on Lake Ontario declined as they usually do from June to July. Lake Ontario has fallen by about its usual amount since it peaked for the year around the middle of June—about the usual time of the year for the lake.

Lake Superior is expected to continue its seasonal rise during August. Water levels usually peak in September on Lake Superior. August levels on Lakes Michigan-Huron will depend on the total water supply the lakes receive during the month. Although levels on Lakes Michigan-Huron will likely begin to fall during August, wetter than average conditions could

delay the start of their annual seasonal decline. Levels on lakes St. Clair, Erie and Ontario are expected to decline during August as lakes St. Clair and Erie begin, and Lake Ontario continues, their annual seasonal declines.

A Beautiful Place to Live...

The shorelines of the Great Lakes and the upper St. Lawrence River have some of the most attractive real estate in Ontario. Owning lakeshore property can be a dream come true; but that dream can become a nightmare if you are unaware of, or ignore, the potential risks.

(continued on next page)

Great Lakes Water Level Information					
	July 2003 Mont	hly Mean Level	Beginning of Aug	ust 2003 Level	
Lake	Compared to Monthly Average (1918-2002)	Compared to One Year Ago	Compared to Beginning-of-Month Average (1918-2002)	Compared to One Year Ago	
Superior	27 cm below	10 cm below	26 cm below	11 cm below	
Michigan-Huron	58 cm below	29 cm below	56 cm below	30 cm below	
St. Clair	28 cm below	18 cm below	24 cm below	16 cm below	
Erie	13 cm below	6 cm below	9 cm below	2 cm below	
Ontario	6 cm above	14 cm below	7 cm above	6 cm below	



...but Be Aware of the Potential Risks

With the below-average water level conditions we have seen over the past few years, it is easy to forget that as recently as the summer of 1997 near-record high levels were a concern. Great Lakes water levels can change significantly over a period of years due to climatic and weather trends. They change seasonally as water supplies vary throughout the year, and they can change dramatically in a matter of hours as strong winds blow over the lakes. causing a phenomenon known as "wind set-up" or "storm surge". Large waves can be an additional hazard during storm events.

You'll need to do some research before you buy or alter shoreline property to ensure that you don't end up

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July Precipitation over the Great Lakes As a percentage of the long-term July average:

Great Lakes Basin 96% Lake Erie 88%
Lake Superior 110% (including Lake St. Clair)
Lakes Michigan-Huron 87% Lake Ontario 100%

NOTE: These figures are preliminary

with an expensive surprise instead of a pleasant investment. Some shoreline areas along the Great Lakes and St. Lawrence River are at risk to flooding, erosion and dynamic beach processes.

For information that applies specifically to the shoreline property you are interested in, you should start by contacting the Conservation Authority (CA) or office of the Ontario Ministry of Natural Resources (OMNR) that covers your area. Be sure to ask about any setback, zoning or shoreline alteration restrictions that may apply to the property. These will be important if you plan to make any changes or build any structures.

Upcoming PIAG Public Meetings

The International Lake
Ontario - St. Lawrence River
Study is now in its third year.
To ensure that the study
reflects the interests of the
public, the Study's Public

Interest Advisory Group (PIAG) will be holding meetings in various locations along the Lake Ontario and St. Lawrence River shorelines. Meetings are currently planned for September 10th in Sodus Bay, NY and September 24th in Montréal, Quebec.

For more information regarding these events, or to register your attendance, please contact Michelle Tracy at: (613) 992-5727.

July Outflows from the Great Lakes

As a percentage of the long-term July average:

Lake Superior 89% Lake Erie 98% Lake Huron 82% Lake Ontario 96%

LEVEL news Great Lakes - St. Lawrence River



Volume 11, Number 9

September 8, 2003

Important News Regarding the Distribution of the Monthly Water Level Bulletin and LEVELnews by Mail

For the past 30 years,
Fisheries and Oceans Canada
(DFO) has been preparing
and distributing the Monthly
Bulletin "Water Levels,
Great Lakes and Montreal
Harbour." This publication
has been mailed to the public
free of charge. Over the past
10 years, Environment
Canada has prepared
LEVELnews each month for
distribution with the Bulletin,
courtesy of DFO.

If you receive the Monthly Water Level Bulletin and LEVELnews in the mail each month, this month's envelope includes an important notice

regarding the distribution of these two publications.

In order to reduce operating costs, DFO is considering cancelling printing and mailing copies of the Monthly Water Level Bulletin. The last issue that is proposed to be mailed out will be the September 2003 issue that will be sent out in October 2003. The Bulletin will continue to be available on the World Wide Web at: http://chswww.bur.dfo.ca/danp/wlgraphs e.html

Therefore, LEVEL*news*, which is normally included with the Bulletin, would no

longer be mailed to subscribers. LEVELnews will also continue to be available on the Web at: http://www.on.ec.gc.ca/ water/level-news/

If you have concerns about this cost reduction measure, you are invited to contact DFO by mail at:

Monthly Bulletin of Water Levels Canadian Hydrographic Service 867 Lakeshore Rd Burlington, ON L7R 4A6 or by telephoning: 1 877 247-5465.

Before doing so, however, we would like to encourage you (continued on next page)

Great Lakes Water Level Information						
	August 2003 Monthly Mean Level		Beginning of September 2003 Level			
Lake	Compared to Monthly Average (1918-2002)	Compared to One Year Ago	Compared to Beginning-of-Month Average (1918-2002)	Compared to One Year Ago		
Superior	27 cm below	11 cm below	28 cm below	11 cm below		
Michigan-Huron	57 cm below	29 cm below	58 cm below	31 cm below		
St. Clair	24 cm below	13 cm below	21 cm below	14 cm below		
Erie	7 cm below	2 cm above	9 cm below	2 cm above		
Ontario	11 cm above	8 cm above	6 cm above	11 cm above		

to view both publications on the Web at the addresses provided earlier. Both publications are available on the Web about two weeks before they arrive by mail. If you don't have access to the Web at home, it may be available at your local public library.

The electronic version of LEVELnews is posted on the Web around the 8th or 9th of each month. You can read the LEVELnews text directly on your computer's screen or you can open, view and print an Adobe Portable Document Format (or PDF) version. When printed, the PDF version has virtually the same look and feel as the one currently distributed by mail.

Once you've read LEVEL*news*, be sure to review the latest Monthly Water Level Bulletin (the

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Editor, Chuck Southam

Aussi disponible en français

August Precipitation over the Great Lakes As a percentage of the long-term August average:

Great Lakes Basin 86% Lake Erie 74%
Lake Superior 101% (including Lake St. Clair)
Lakes Michigan-Huron 83% Lake Ontario 82%

NOTE: These figures are preliminary

Bulletin is actually available on the Web a few days earlier than LEVEL*news*, as it is usually posted by the 3rd or 4th of the month).

If you find the Web versions of the publications meet your needs, please let DFO know. By voluntarily moving to the Web, you will help reduce costs and eliminate waste, thus helping the environment, regardless of DFO's final decision regarding the end of distribution for the Monthly Bulletin and LEVELnews by mail.

Blackout Response

In response to the mid-August energy emergency, international Great Lakes water management at Niagara and on the St. Lawrence River acted to increase hydroelectric power production.

On the Niagara, the flow over Niagara Falls was reduced at various times to allow greater flow to maximize power generation at Queenston, ON and Lewiston, NY. This redistribution of flow around the Falls did not affect the total flow out of Lake Erie and as such had no effect on water levels on the lake.

The outflow from Lake Ontario was increased temporarily by passing more water through the hydroelectric dam at Cornwall/Massena on the St. Lawrence River. This over-discharge used 1.5 cm of the water previously stored on Lake Ontario by the International St. Lawrence River Board of Control.

August Outflows from the Great Lakes As a percentage of the long form August

As a percentage of the long-term August average:

Lake Superior 89% Lake Huron 82%

Lake Erie 96% Lake Ontario 103%



Volume 11, Number 10

October 8, 2003

The World Wide Web--the Access Medium of Choice

Based on feedback received from mailing list subscribers, Fisheries and Oceans Canada (DFO) has decided to cancel printing and mailing copies of the Monthly Bulletin: "Water Levels, Great Lakes and Montreal Harbour" to the public after this month's edition. Therefore. LEVELnews, which has been distributed along with the Bulletin for the past 10 years, courtesy of DFO, will no longer be mailed to subscribers as well.

Both the Bulletin and LEVEL*news* will continue to be available on the World Wide Web. DFO has also

enhanced the Monthly
Bulletin's website. You can
still view the Bulletin directly
on your computer screen, but
starting this month you can
also open, view, and print an
Adobe Portable Document
Format (or PDF) version.
When printed on standard
letter size paper, the PDF
version has the same look
and feel as the hardcopy
version you are used to—
except for an added splash of
colour.

Be sure to look for the Bulletin on the Web at its <u>new</u> address:

http://chswww.bur.dfo.ca/danp/

You'll also find links directly to LEVEL*news* on many of DFO's web pages.

Current Water Level Conditions

As indicated in the water level information table provided below, water levels on all of the Great Lakes, except Lake Ontario, are below their long-term average as well as levels recorded at the same time last year.

Water levels on lakes Superior and St. Clair are about the same as they were two years ago. Lakes Erie (continued on next page)

Great Lakes Water Level Information					
	September 2003 Monthly Mean Level		Beginning of October 2003 Level		
Lake	Compared to Monthly Average (1918-2002)	Compared to One Year Ago	Compared to Beginning-of-Month Average (1918-2002)	Compared to One Year Ago	
Superior	29 cm below	15 cm below	25 cm below	12 cm below	
Michigan-Huron	61 cm below	30 cm below	61 cm below	30 cm below	
St. Clair	27 cm below	14 cm below	31 cm below	18 cm below	
Erie	11 cm below	Same	13 cm below	4 cm below	
Ontario	2 cm above	10 cm above	1 cm above	11 cm above	

and Ontario are currently about 15 cm higher than they were in 2001. Water levels on Lakes Michigan-Huron began October about 12 cm lower than they were at the same time in 2001.

Although water levels on Lakes Michigan-Huron are still several centimetres above their 1918-2002 period-of-record lows recorded in 1964, levels are currently the lowest they have been at this time of year since then. The latest sixmonth forecast indicates that if low water supply conditions persist throughout the fall and early winter, levels on Lakes Michigan-Huron could begin 2004 as low as they were in 1964. New record low levels are possible under very dry conditions

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September Precipitation over the Great Lakes As a percentage of the long-term September average:

Great Lakes Basin 122% Lake Erie Lake Superior 137% (including Lake St. Clair) Lakes Michigan-Huron 104% Lake Ontario 114%

NOTE: These figures are preliminary

Hurricane Isabel

The remnants of Hurricane Isabel passed over the Great Lakes region on September 19th. Although localized areas did experience intense rain, overall rainfall amounts were less than many people had anticipated. A review of the daily water level data for lakes Erie and St. Clair suggests that the added moisture from the storm did results in a brief pause in the seasonal decline in levels on both lakes.

Storm Season Reminder

Autumn often brings storms packing high winds to the Great Lakes region. Watching large waves crash against the shore can be an enjoyable activity, but please don't risk being swept into the lake by a storm-generated wave. Be sure to stand well back from the water's edge during a storm event.

Thank you

Over the past 10 years, Environment Canada has prepared LEVELnews each month for distribution with the Monthly Water Level Bulletin. The editor of LEVELnews would like to take this opportunity to thank Fisheries and Oceans Canada for helping Environment Canada provide Great Lakes' water level information to the public.

September Outflows from the Great Lakes As a percentage of the long-term September average:

Lake Superior 86% Lake Erie Lake Huron 81% Lake Ontario 100%

NOTE: These figures are preliminary

94%







